DENTAL

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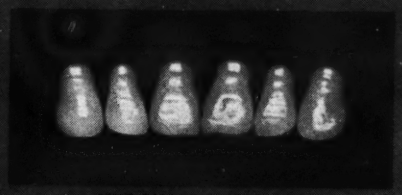

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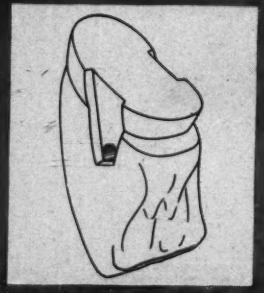

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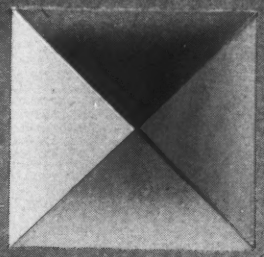

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THE DENTAL Digest

VOL. 53 NO. 1

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ROWE SMITH, D.D.S. (Vanderbilt University, School of Dentistry, 1923) emphasizes periodontics and exodontics in his practice. THE SYSTEMIC ASPECT OF PERIODONTAL DISEASE, which appeared in the DIGEST in November 1940, is one of a number of articles on periodontics that Doctor Smith has contributed to the dental literature. In the current issue, he is the author of OXYGEN THERAPY IN THE TREATMENT OF VINCENT'S INFECTION AND OTHER PERIODONTAL CONDITIONS.

FRANK D. DONLEVY, D.D.S. (Northwestern University, Dental School, 1915) has used fluorescent porcelain in restorations for several years in his general practice. This experience is the basis for his discussion, THE USE OF FLUORESCENT PORCELAIN IN DENTAL RESTORATIONS, which appears in this issue.

THOMAS O'DRISCOLL LEGGE, D.D.S. (Royal College of Dental Surgeons, Toronto, 1924) is making his first contribution to the DIGEST this month. In his general practice he has developed an original technique, ESTABLISHING CENTRIC RELATION IN THE EDENTULOUS MOUTH WITH A MANDIBULAR POSITIONER, which he describes in detail.

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Oxygen Therapy in the Treatment of Vincent's Infection and Other Periodontal Conditions

ROWE SMITH, D.D.S., Texarkana, Arkansas-Texas

So-called "recurrence of Vincent's infection" in most cases is probably a continuation of the initial infection and reflects the inadequacy of the periodontal treatment employed. Plasma cells which are present in chronic inflammation remain when a therapeutic agent fails to act within as well as on the tissues. The continued presence of these cells indicates that the infection is persisting.

Oxygen is a therapeutic agent which differs from others in acting both within the tissues and on them. This action changes the character of the gingival and mucosal tissues so that they become more resistant to infection.

Oxygen acts rapidly, causes no tissue damage and less pain than other agents. Its application in over three thousand cases by Doctor Smith substantiates the effectiveness of oxygen therapy.

PROPER TREATMENT for Vincent's infection should rapidly stop the progress of the disease, eliminate etiologic factors, and aid in repair of the tissue damage without further injury.

Origin of Method

About thirty years ago William Dunlop[1] originated the method of introducing oxygen into the gingival and contiguous tissues as a part of his pyorrhea treatment. This treatment has never gained wide usage. At the time Dunlop introduced oxygen compound gas, Vincent's infection as such was virtually unknown, and I have never been able to find where he or any of his colleagues made mention of the use of the gas for the treatment of Vincent's infection or the value of oxygen as a diagnostic aid in periodontal disease.

It is not necessary, however, to use the original Dunlop compound oxygen gas. The same results can be obtained by using pure oxygen. Competent research has revealed that oxygen is the essential therapeutic agent.

Oral Conditions Accompanying Vincent's Infection

Often complete control or a cure cannot be accomplished in Vincent's infection by any single form of treatment because the condition is frequently complicated by (1) the presence of supragingival and subgingival calculus, (2) gingival pockets and flaps where the lesions are superimposed upon the epithelial lining of the pocket, and (3) by nutritional disturbances. In these cases all the various aids known, such as scaling, subgingival curettage, gingivectomy, exodontics, restorative dentistry, correction of nutritional deficiencies, must be employed diligently if periodontal health is to be established and main-

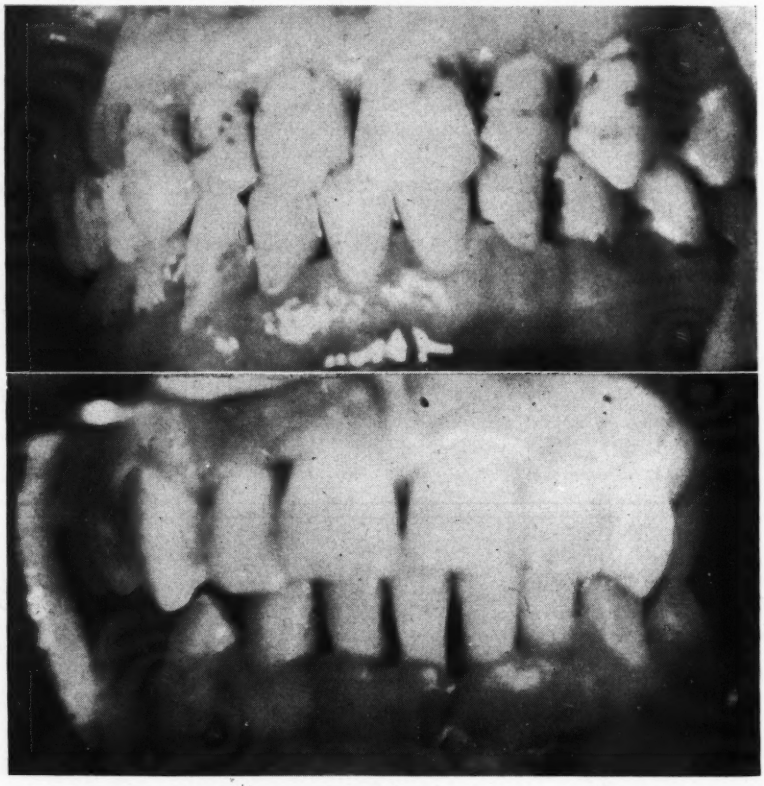

Fig. 1A—Generalized etching of the crowns and root surfaces and loss of interdental tissue following use of chromic acid.
Fig. 1B—Extensive loss of interdental tissue with deep interdental caverns between the un-united labial and lingual gingival tissue. Results obtained by hydrogen peroxide-sodium perborate.

[1]Dunlop, W. F.: Pyorrhea and Its Treatment, Chicago, Dunlop Research Institute, 1913.

Editor's Note: The photographic illustrations were made from natural color Kodachromes and are faithful monotone reproductions of the full color originals. There has been no mechanical or manual exaggeration or retouching of the original copies.

tained. Occasionally it is necessary to obtain competent medical collaboration in order to eliminate or control various systemic disturbances which may adversely affect the periodontal tissues.

Figures 2, 3, and 4 show an acute and extensive case of uncomplicated Vincent's infection in which *only* oxygen therapy was employed to bring about a cure and repair of the damaged gingival and mucosal tissues.

Treatment of Acute Vincent's Infection

Spraying—Oxygen can be applied from the tank in the form of either a wet or a dry spray or by applying nascent oxygen.[2] In the treatment of acute Vincent's infection, it is advantageous first to apply the wet spray to cleanse rapidly the oral and pharyngeal tissues. After the wet spray has been used, the dry oxygen is sprayed with the needle about 1 millimeter away from the lesions. Care is taken to spray all gingival crevices, interproximal spaces, beneath any gingival flaps, and any lesions involving the throat, lips, and tongue. The tongue should be sprayed always because the papillae of the tongue collect debris and harbor potentially destructive bacteria.

In order to permit all involved gingival, mucosal, and pharyngeal tissues to absorb all the oxygen possible, the patient is instructed to close his lips tightly around the large needle; and the entire oral and throat cavities are inflated to the maximum capacity with dry oxygen gas which is retained approximately one minute. This is repeated two or three times at each treatment.

In the treatment of acute Vincent's infection, insufflation of the tissues usually is not necessary, as the tissues seem to absorb a sufficient amount of oxygen by spraying. The amount of oxygen applied by spraying is *not* reduced if hemorrhage is encountered for, if the oxygen treatment is applied properly, large quantities of blood will usually be released from the involved tissues.

Results—In many cases an acute

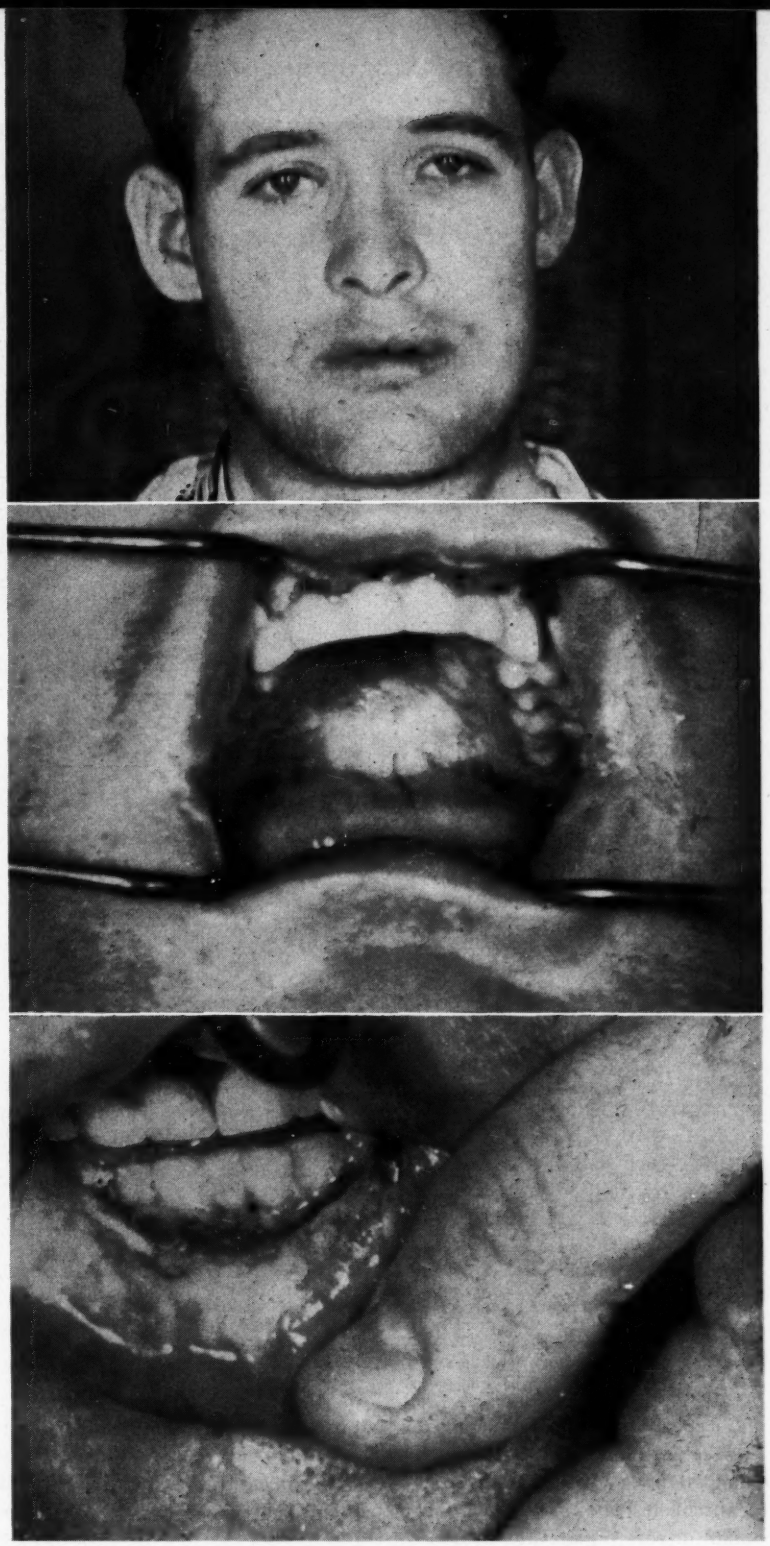

Fig. 2—(top) Medical examination revealed patient, aged 21, acutely ill, toxic, unable to swallow, coughing frequently, involvement of eyelids and conjunctiva, temperature 102° F., very weak with generalized tremor. Had been unable to eat for several days. Physical and laboratory examination negative except for conditions shown in photographs. The entire oral mucosa, gingivae, hard and soft palate (center) and lips (bottom) were involved. Patient had had anti-Vincent's treatment by family physician and dentist for five days before presentation. History showed that the diet included the following each day: meat at least once, milk one quart, green vegetables average of two, citrus fruits, tomatoes and raw cabbage at least once, white bread, practically no sweets. No calomel or any injections. Smokes about 20 cigarettes a day. Alcohol occasionally, mainly beer. Family dental history negative.

[2]Orban, Balint: Action of Oxygen on Chronically Inflamed Gingival Tissue, J.A.D.A. 29:2018-2025 (November) 1942.

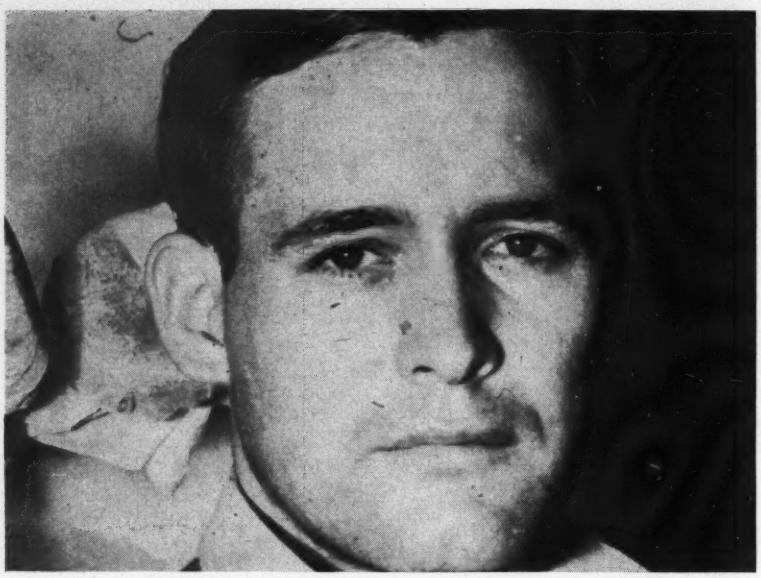

Fig. 3

Figs. 3 and 4—Complete repair of all damaged gingival and mucosal tissues on the twenty-fourth day after beginning of oxygen treatment. Patient had regained normal strength and weight and was able to return to work. No prophylaxis was required. No members of family or friends were similarly affected and there has been no recurrence of the condition after five years.

Vincent's infection is accompanied by severe systemic disturbances. The temperature may be as high as 104° Fahrenheit. The patient may complain of severe pain, loss of appetite and body weight, and extreme malaise; and often the cervical lymph nodes are tender and enlarged. Blood examination usually shows a moderate elevation of the white cell count and an increased sedimentation rate. Within twenty-four hours after the first oxygen treatment, general improvement of the patient's condition is readily noted. He is able to take nourishment, his temperature returns to normal, and extreme weakness and malaise are greatly lessened. All pain is eliminated almost immediately and extreme soreness and tenderness disappear in twelve to thirty-six hours.

Treatment of Subacute Vincent's Infection and Gingivitis

In treating subacute Vincent's infection and all types of gingivitis, such as hypertrophic (including the type caused by dilantin sodium therapy), hemorrhagic, desquamative, adolescent and even pregnancy gingivitis, it is best to insufflate all involved tissues with oxygen. The technique for insufflation with dry oxygen is a little more precise and delicate but is easily mastered by application of manual skill, careful observation, and good common sense.

Technique of Insufflation—1. Usually, treatment is begun on the mesial surface of the most distal upper right tooth, employing approximately 20 pounds of pressure for acute cases and 30 pounds pressure for the more chronic type. The dry oxygen needle point is inserted slowly without force into the gingival crevice and is manipulated gently up and down in the crevice to prevent the tissues clogging the needle. The same technique is applied for short intervals on lingual, distal, and buccal. The next tooth on the upper right side is treated likewise and the treatment is continued around to the last upper left tooth. Then the supporting tissues around the lower teeth are treated in the same manner.

2. The oxygen blows into the tissues and can be seen flowing into and through the tissues and capillaries, simulating the appearance of a fluid flowing through a glass tube. The tissues seem to absorb oxygen as a dry sponge absorbs water. *The lips, tongue, and cheeks should be held away from the alveolar mucosa so that the effect of the oxygen in the tissues can be observed readily by the operator.* The flow of the oxygen into the superficial tissues is usually upward in the case of the upper teeth, and it also may be radiating or diffused. In the case of the lower teeth it is usually downward, in a diffused or radiating manner.

3. In some areas the initial introduction of oxygen may occur as a lightning flash in the tissues, followed shortly by a rapid change of color to an arterial red or a blanched pinkish color over a large area, sometimes producing a swollen area. The blanching and slight swelling usually remain for only a short time. *If a flash occurs, the needle should be withdrawn quickly to avoid producing an exten-*

sive emphysema which may last for several hours.

4. Usually the oxygen flows slowly into the tissues. Its presence can be noted under the alveolar mucosa by the gradual formation of emphysematous areas which may vary in size. *Where these areas form, the needle is allowed to remain for a longer time, according to the size of the formations and the rapidity with which they occur.* These formations will disappear in a short time, leaving pink diffusion of the gingival and mucosal tissues. Sometimes, near the site of introduction, an area may become almost white, probably due to capillary compression. The whitish areas disappear in a few minutes.

5. When the technique of oxygen insufflation is employed properly, there is very little pain or discomfort for the patient. If there is severe pain, it usually is caused by contact of the cold oxygen with the cementum. *Warming the oxygen will eliminate this pain.*

It is usually easy to insufflate tissues which seemingly need oxygen; it is very difficult, and almost impossible, to insufflate apparently normal periodontal tissues.

Scaling—After the first treatment, any calculus present should be removed. Occasionally it is necessary to scale the teeth of children as young as two years of age as a part of the treatment for Vincent's infection. If scaling is necessary, ethyl chloride anesthesia may be employed.

After a few days of the oxygen treatment, it is entirely safe to undertake gingivectomy, tooth removal, and any other dental treatment that may be required.

Frequency of Treatment—The oxygen treatment as outlined usually is repeated daily for two or three days. Then the patient is treated every third or fourth day until complete repair of all involved tissues has taken place. For adults this usually requires about two weeks after the third daily treatment. My records show that about four treatments are required for the cure of acute Vincent's infection in children under fifteen years of age. Figure 5 illustrates the usual type of acute Vincent's lesions seen in children. Figure 5C shows the case on the sixteenth day; the other photographs are views before any treatment was administered.

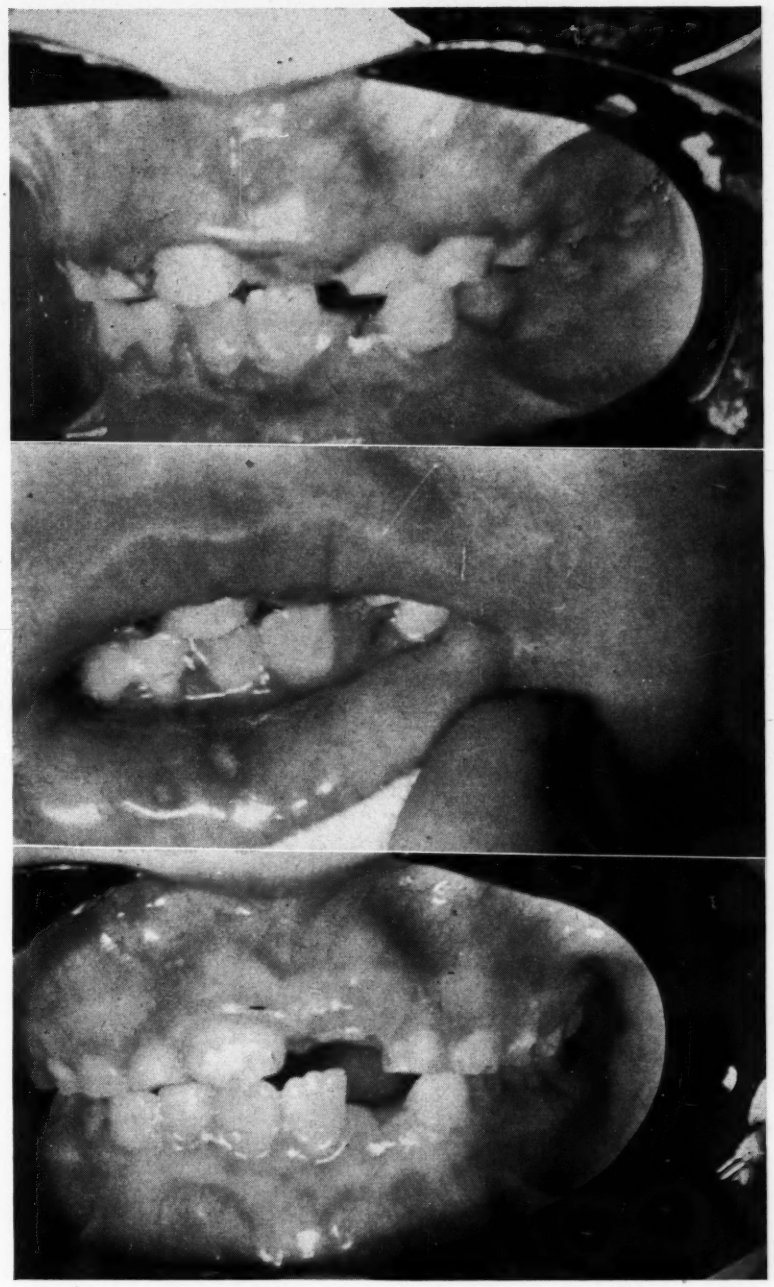

Fig. 5A—Girl, aged 7½ years. Used gingival Vincent's lesions as seen in children.
Fig. 5B—Mucosal lesions, same patient.
Fig. 5C—Complete repair on sixteenth day following three oxygen treatments.

Results of Treatment—Figures 7A and 7B illustrate the effect of oxygen treatment in chronic hemorrhagic, edematous, and mildly hypertrophic gingivitis in a boy aged 15. Chronic gingival hemorrhage annoyed and embarrassed this patient for a long period of time. Three weeks' treatment with oxygen alone completely eliminated the gingival hemorrhage; the tissues returned to normal color and contour, and the patient reported feeling much better. In Figure 7B the swollen area involving the labial gingivae and mucosa over the left central and lateral incisors is the result

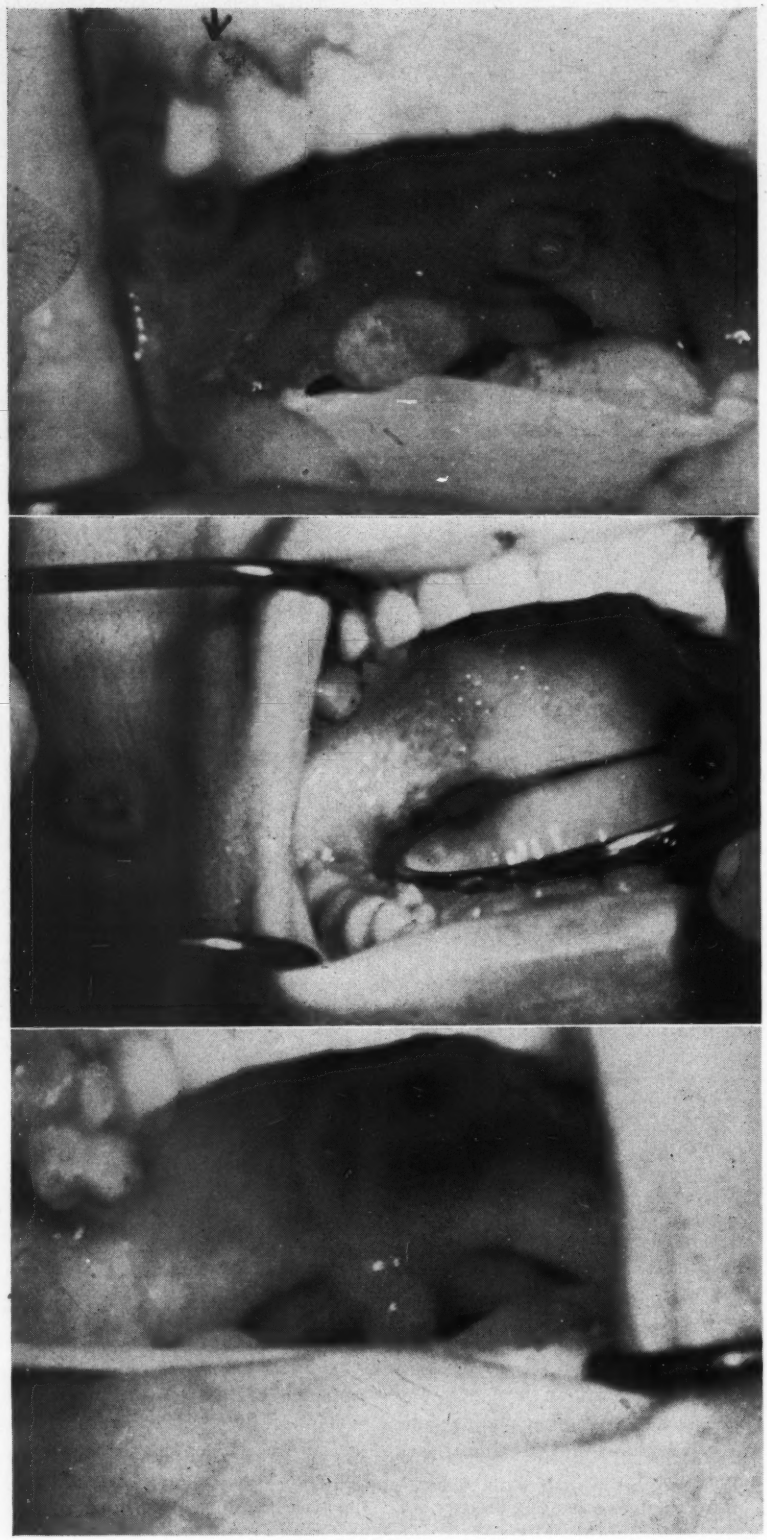

Fig. 6A—Oral and pharyngeal mucosal Vincent's lesions. Note bismuth blue line involving gingival inflammatory tissue on right buccal.
Fig. 6B—Partial repair on seventh day.
Fig. 6C—Complete repair on fourteenth day. Compare condition of uvula and pharyngeal areas with Figure 6A.

of oxygen insufflation and demonstrates oxygen in the tissues. Figure 7A was made before the oxygen was applied and is for comparison. Figure 7C shows gingival and mucosal conditions in which oxygen therapy will quickly restore the tissues to health.

The best index for final dismissal of the patient is (1) that no hemorrhage occurs when the dry oxygen needle is introduced into all gingival crevices, and (2) the tissues fail to take up any perceptible amount of oxygen.

Teaching Oral Hygiene to Patient—During the course of treatment the patient is taught correct oral hygiene[3] and gingival stimulation by the use of good toothbrushes and round toothpicks or Stim-U-Dents. He is never dismissed until he assures the dentist that he understands: (1) how to maintain oral hygiene, (2) how to practice gingival stimulation, (3) the necessity for proper food selection and (4) regular periodic dental examinations and prophylaxis.

No mouthwashes are needed, and none is prescribed for home use. This is very important as it is not wise to encourage the tendency to self-treatment, which often terminates disastrously. There is a tendency, too, for patients who have had Vincent's infection to attempt to treat other members of their family or their friends by giving them mouthwashes or prescriptions which they have used. In this manner the disease is often allowed to become chronic, with accompanying irreparable loss of periodontal tissue and unnecessary exposure of root surfaces of the teeth. These areas are usually sensitive and prone to caries. Also, in chronic cases the general health is frequently adversely affected.

It appears that nearly all of the various types of gingivitis are complicated by the bacteria associated with Vincent's infection and that the form of lesions produced, extent and rapidity of tissue destruction, and other usual complications depend mainly upon the general resistance of the patient, virulence of the organisms, and

[3]Smith, Rowe: Fads in Periodontal Treatment That Have Passed into Disuse and Fundamentals for Successful Treatment That Remain, J.A.D.A. 26:1318-1324 (August) 1939.

their local environment. Vincent's infection appears to be one of the so-called local diseases, the incidence of which depends on a generalized lowered resistance.

Areas Involved In Vincent's Infection

I have observed that there are apparently two different manifestations of Vincent's infection:

1. In one type the lesions involve only the interdental gingival tissues and, even though the oral mucosa is in contact with the lesions almost constantly for months, the mucosal tissues never become affected (Fig. 1B).

2. In the other type the interdental tissues are involved along with scattered or entire areas of the oral mucosal, tongue and pharyngeal tissues (Figs. 2 and 5).

Why, in the large majority of cases, the Vincent's lesions will be confined to the interdental tissues and, in a smaller number, the Vincent's lesions will spread to the contiguous tissues, I do not know.

Recurrence of Vincent's Infection

Dental literature contains many reports about the common recurrence of Vincent's infection. No one doubts that it is possible for Vincent's infection to recur; however, I believe that most cases reported as recurrent are a continuation of the initial infection. In treating over three thousand cases of Vincent's infection, oxygen therapy has always effected a cure and there has been no recurrence where all required periodontal[3] treatment was carried out. The same successful results have been experienced with oxygen therapy in all cases of so-called recurrent Vincent's infection after other forms of treatment had been used, including intravenous and intramuscular injections of the various forms of bismuth and arsenical preparations and, lately, intramuscular and oral administration of penicillin.

Figure 6 shows acute Vincent's lesions, involving the hard and soft palate area on the right, extending into the pharyngeal tissues. The uvula was practically destroyed by Vincent's lesions. (This patient has had over thirty injections of bismuth and ar-

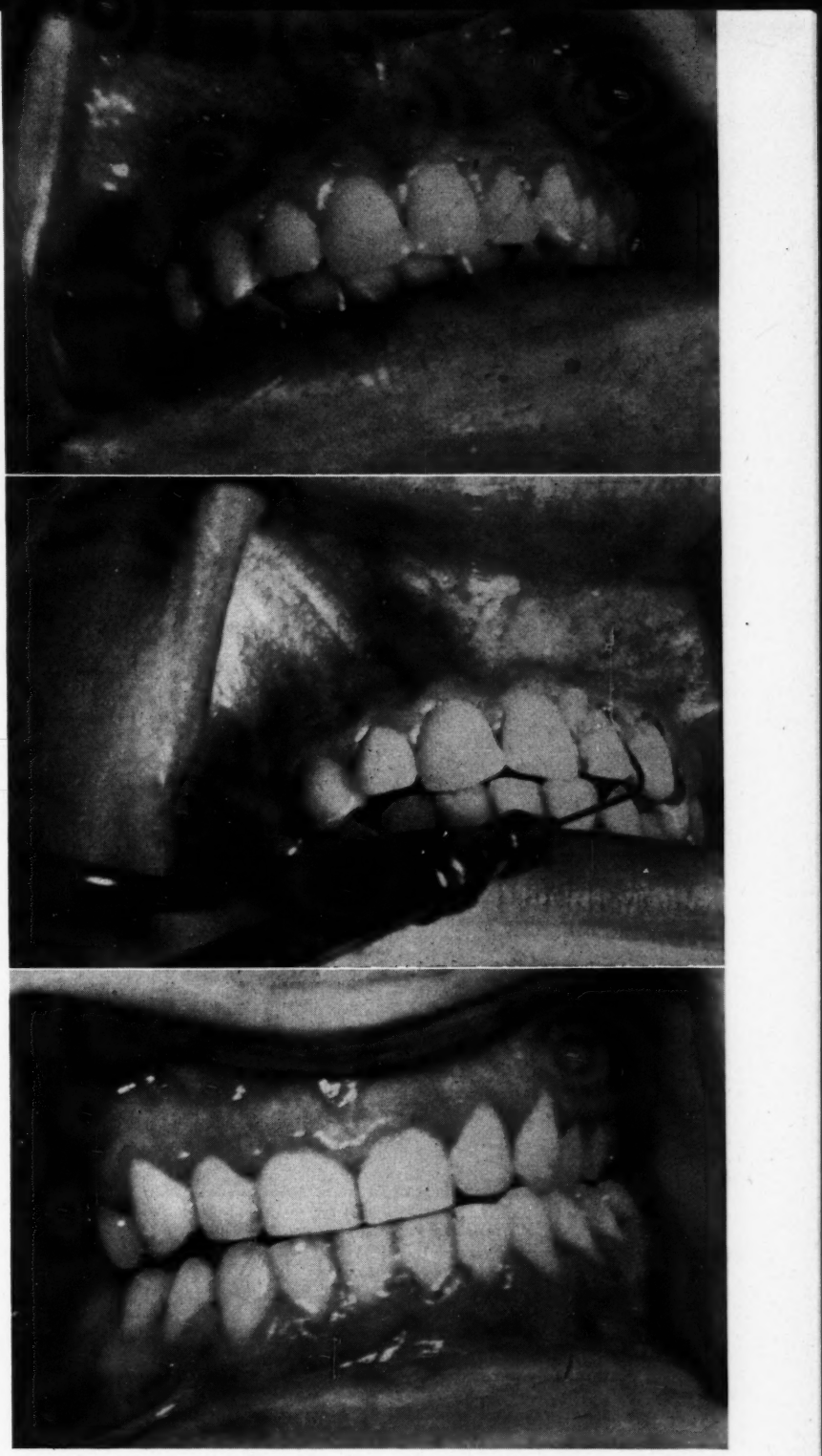

Fig. 7A—Chronic, slightly hypertrophic, edematous and hemorrhagic gingivitis.

Fig. 7B—Oxygen needle in place in interdental crevice. The gingival and mucosal areas from the upper right central to the left first bicuspid show the results of insufflation with oxygen. The same area on the right has not been insufflated. Note whiteness and enlargement of the interdental papillae between the upper left central and lateral incisors.

Fig. 7C—Chronic, hypertrophic, edematous and cyanotic gingival and mucosal disturbance with destruction of the interdental papillae especially in the upper right bicuspid, cuspid and lateral incisor region. Oxygen therapy is the most valuable and reliable periodontal therapeutic aid in the restoration and maintenance of periodontal health in this and other similar types of gingivitis.

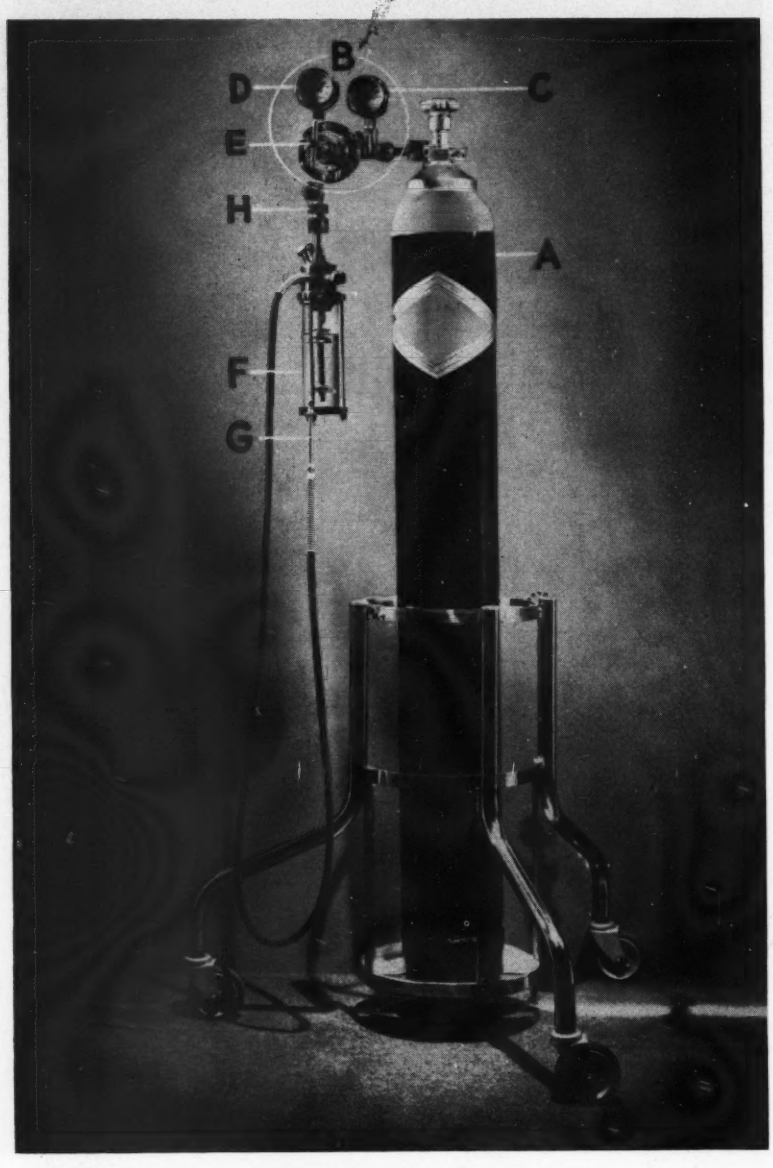

Fig. 8—Oxygen Apparatus

(A) *Standard "G" oxygen cylinder (U.S.P.).*
(B) *Single stage pressure reducing regulator.*
(C) *Cylinder contents pressure gauge.*
(D) *Working pressure gauge.*
(E) *Wing bolt to control working pressure.*
(F) *Pressure jar containing liquid for making wet spray.*
(G) *Metal handpiece to which can be attached standard thread treatment needles of various gauges.*
(H) *Since the wet oxygen is not absolutely necessary, the pressure jar can be eliminated and any desired length of reinforced rubber tubing can be attached at H, thus reducing the cost of the oxygen machine materially as the cost of the dry oxygen apparatus does not exceed $40 and is easily available.*

senic for syphilis. The familiar bismuth blue line can be seen in the buccal gingival and pharyngeal tissues.) Two oxygen treatments cleared up the lesions completely within a period of fourteen days. Also, the bismuth discoloration disappeared.

Lesions Resembling Vincent's Infection

There are many lesions occurring in the oral cavity and contiguous areas which resemble those of Vincent's infection. These lesions are often the result or reflection of some serious systemic disease or disturbance. They are seen frequently in pemphigus, lichen planus, hemorrhagica purpura, vitamin deficiencies, desquamative gingivitis, and the various blood dyscrasias. Proper consideration should be given these conditions before making a diagnosis of Vincent's infection.

Action of Oxygen on Tissues

In ordinary gingival infection, the inflammatory reactions are closely associated with the gingival margins. The blood vessels near the crevicular surface are dilated and congested. In these and adjacent areas the circulation rate is greatly slowed, thus reducing the oxyhemoglobin in the tissues, and gingival and mucosal cyanosis is present. A state of stagnant anoxia seems to exist in the tissues. Gingival inflammation increases oxygen consumption, which may account for tissue proliferation. Evidently in some manner the tissues are deprived of the required amount of oxygen, and it seems that the favorable tissue changes which are observed following oxygen therapy are due to the artificial increase of oxygen in the tissues. Obviously, the integrity of the tissues is restored.

Clinical Changes—When oxygen is judiciously employed as a periodontal therapeutic aid, desirable clinical changes can be readily observed, such as a change in gingival color from the many red, bluish, deep purple, or cyanotic shades that the gingivae and oral mucosa take on when affected by the various types of periodontal disturbances or diseases, to a normal rosy pink color. Chronic, slow, sporadic gingival hemorrhage ceases and gingival edema subsides. The gingival tissues lose their loose, flabby condition and are restored to a more normal contour. A decrease in the abnormal mobility of the affected teeth may be noted.

Microscopic Changes—Orban[2] has shown that large numbers of plasma cells, which denote chronic inflammation, are found in the tissues adjacent to periodontal lesions and that following treatment (without oxygen) these cells usually remain after clinical

symptoms have disappeared and apparent tissue repair has taken place. This may explain why there is a tendency for a recurrence or tissue reversion after treatment of all types of periodontal disease in which oxygen has not been employed as a part of the treatment and periodically as a prophylactic measure. Wherever oxygen gas or nascent oxygen is properly administered, these plasma cells disappear and an active mesenchyme tissue replaces the plasma cells. For this reason, also, any type of periodontal treatment will give better results if oxygen therapy is employed in conjunction with it.

Comparison With Other Therapeutic Agents

Since 1923 I have used oxygen consistently, applied by insufflation and spraying, for the treatment of Vincent's infection and other types of periodontal disease. Experience has proved to me that it is the most effective treatment that can be employed in the control or cure of Vincent's infection and for the re-establishment and maintenance of periodontal tissue health and vitality. It is the only agent with which I am familiar that will change the character of the gingival and mucosal tissues.

1. It acts *within* as well as *on* the tissues, whereas other medicaments, such as trichloracetic acid, silver nitrate, chromic acid and others act *only on* the tissues.

2. The application of oxygen never does any damage to the tissues, while other drugs commonly used in the treatment of Vincent's infection may cause serious injury. For instance, chromic acid may have a very marked escharotic effect, thereby delaying healing; and it will often cause etching of the crown and root surfaces, which is painful and irreparable damage (Figs. 1A and 1B). Figure 1A shows the result of using chromic acid in a mouthwash and also by local application. Figure 1B reveals lack of repair of interdental gingival tissues as a result of sodium perborate treatment.

Comments

If oxygen is applied properly where indicated, immediate results can be attained which are superior to any achieved without it and less pain and effort are involved. Its use also helps maintain a healthy condition of the periodontal tissue.

Those dentists who may be interested in but who are still skeptical about the value of oxygen as an aid in treating Vincent's infection and other types of periodontal disease should make the following test: If the case fails to recover or respond satisfactorily after all routine periodontal treatments and therapeutic aids have been used, apply the oxygen as outlined, and note the results obtained. Try to include in the experiment at least twenty-five cases. The general improvement in these cases will be a pleasant surprise.

Summary

The functions of oxygen therapy are as follows:

1. Oxygen therapy causes an almost instantaneous stoppage of the pathologic process and helps to nullify the bacterial toxins.

2. It destroys the accompanying anaerobic organisms and eliminates the necrotic tissue, which may protect bacteria from drug action.

3. It replenishes the partly depleted oxygen tension of the affected tissues, reduces venous stagnation, and improves local tissue metabolism and resistance.

4. The local hyperemia produced aids the cells of inflammation in the debridement of destroyed tissues and in carrying away the waste products, thereby bringing about rapid repair of the damaged tissues.

405 *East Fifth Street.*

DENTAL MEETING Dates

Massachusetts State Board of Dental Examiners, regular meeting, February 10-12. For information write to Doctor John C. Wilson, 413N State House, Boston.

•

University of California, College of Dentistry Alumni Association, regular meeting, St. Francis Hotel, Los Angeles, January 26-27.

•

Ohio State Board of Dental Examiners, regular meeting, March 10-15. For information write to Doctor Earl D. Lowry, 79 East State Street, Columbus.

The District of Columbia Postgraduate Clinic formerly (the Five-State Postgraduate Clinic), annual meeting, Hotel Statler, Washington, D. C., March 10-13.

•

The Thomas P. Hinman midwinter clinic, Municipal Auditorium, Atlanta, Georgia, March 23-25.

•

The Dental Society of the State of New York, seventy-ninth annual meeting, Hotel Statler, Buffalo, May 13-16.

The Use of Fluorescent Porcelain in Dental Restorations

FRANK D. DONLEVY, D.D.S., Chicago

This discussion concerns a recently developed quality of porcelain which contributes a more natural appearance to dental restorations. A technique is not presented; rather, the object is to show why better results are obtained in restorative treatment when certain materials are used to produce fluorescence.

Fluorescence and Phosphorescence Compared

Fluorescence may be defined as the production of light by the transformation of invisible ultraviolet energy into visible light. Substances having this property of fluorescence are called fluorescent materials. They emit light only while the exciting radiation is present. Phosphorescence, on the other hand, is the property of "shining in the dark" *after* exposure to light, as illustrated in luminous dials on clocks. It is interesting to note that phosphors are used to create the various colors in fluorescent lighting, calcium tungstate, for instance, giving blue light, zinc silicate green light, and cadmium yellow and pink light.

Although phosphorescence and fluorescence are closely related, they are entirely different in their emission of light. The fluorescent light is much more intense than the phosphorescent light. The latter, however, is much more penetrating; it can penetrate much like the x-ray.

Fluorescence in Restorative Materials

With this knowledge in mind, the claim of a manufacturer that his product has fluorescence takes on significance and a clearer meaning. This fluorescent quality is an important feature of dental restorations. The natural human teeth have it in a notable degree, as do the fingernails; in fact, the whole body has it. Dental restorations that do not have this property are not as natural-looking as those that do.

Fluorescence has nothing to do with the translucency or transparency of the incisal edge of porcelain teeth. There is not as much difference as one would think there would be in the translucency of the old type porcelain teeth and the new products. The latter have the fluorescent quality together with other improvements, such as more transparent incisal edges.

Determining Presence—It requires the action of the ultraviolet ray on an object to establish whether or not that object has fluorescence. The greatest source of this ultraviolet ray is daylight. Bear in mind that the ray is invisible. Artificial light has various degrees of the ultraviolet ray according to the color and type of the bulb, and other considerations. The ultraviolet bulb naturally has an abundance of ultraviolet ray, but strangely, it gives only weak *visible* light, and that small amount is not entirely ultraviolet.

Tests and experiments were made on dental restorative materials with some ultraviolet equipment to determine which of them had fluorescence. Materials that *do not* have any fluorescence are: (1) the pink and clear acrylics, (2) metal restorations, (3) silicate cement restorations, and (4) most of the older type porcelain. Those that *do* have the fluorescent property are the most recent types of teeth and facings. An object does not have to be porcelain to emit the fluorescent ray; pink dental wax and many papers may do so, too.

Advantages—A front tooth restored with a large silicate restoration has no fluorescence. Although it may match the tooth well in color, the ultraviolet ray will prevent its being a perfect restoration under certain conditions. An actress who has crowns or bridges in the front of her mouth, possibly nonfluorescent, will tell you of the trouble she has in her photographs. This is especially true in the movies. In such circumstances, a tooth which photographs poorly must be corrected.

Have you ever been attracted to an off shade tooth of a prominent citizen speaking before a microphone in a newsreel? It was not that this tooth did not match the rest of his teeth but only that the porcelain tooth turned a brownish color, if nonfluorescent, when exposed to the ultraviolet ray which was abundant in the strong lights used in making the movie. A great deal of this ray is present in light derived from carbon arcs. The color change is more noticeable in artificial light than in daylight because the artificial light is weaker and cannot offset the ultraviolet ray as well as bright daylight.

In Jacket Crowns—Jacket crowns can now be made with fluorescent porcelain. The results contribute satisfaction to restorative treatment. The new hue shade guide is used to obtain the shade, for example, 67. The crown is made accordingly of 67 gingival porcelain and 67 incisal porcelain and a close match of this shade is obtained. Most surprising is the fact that the crown does not have any transparent incisal edge. The fact that the crown has the fluorescent property gives it a new hue look. Another interesting feature of this porcelain is that few shades are necessary. Shades 65, 69, 77, and 81 have taken care of most practical cases.

There are several fluorescent porcelain powders on the market for jacket crown construction. If fluorescent, they will be labeled so. The one

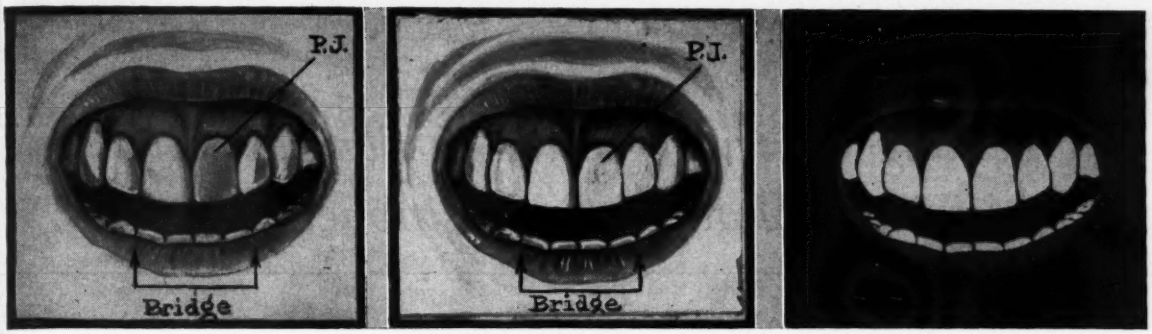

Fig. 1—Using fluorescent porcelain.

(Left) A jacket crown and bridge teeth of fluorescent porcelain are only barely distinguishable from natural teeth in daylight, if at all. (Center) They remain the same under incandescent lighting. (Right) When exposed to the ultraviolet ray in a dark room, both the natural and porcelain teeth "light up."

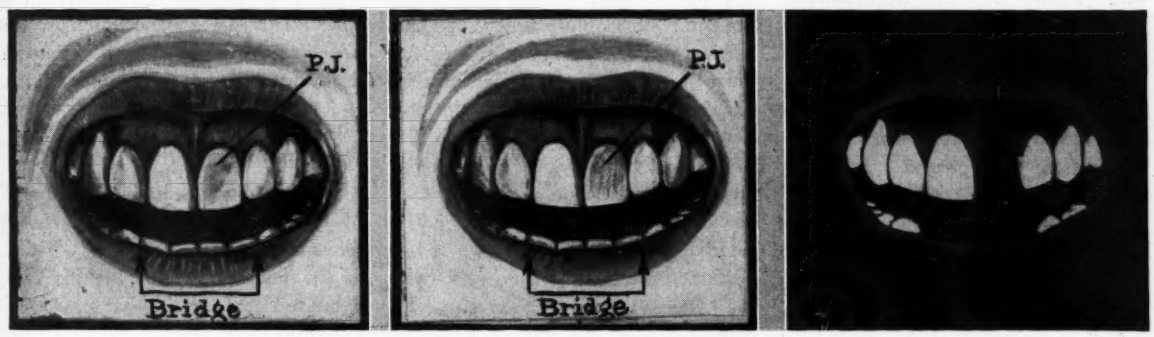

Fig. 2—Using nonfluorescent porcelain.

(Left) A jacket crown and bridge teeth of nonfluorescent porcelain are only barely distinguishable from natural teeth in daylight. (Center) Under incandescent lighting, the correct shade may not hold, according to how much ultraviolet ray is present. The type of lighting would influence the shade. (Right) When exposed to ultraviolet ray in a dark room, the jacket crown and bridge teeth black out; the natural teeth "light up."

used by the author is marketed under the name Fel-Por.

Comments

Porcelains and their gradual improvement are an old and interesting subject. The skills involved in making porcelains have been handed down from generation to generation and are much older than dentistry. The improvements in dental porcelains during the past few years have been made, I believe, in respect to two features, translucency and fluorescence. These improved qualities appear in many jacket crowns, almost all the new type teeth, and some few other restorative materials. The techniques of preparing and constructing the crown are mastered more by ability and experience than by the use of any certain method or set of instruments.

55 *East Washington Street.*

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Establishing Centric Relation in the Edentulous Mouth With A Mandibular Positioner

T. O'D. LEGGE, D.D.S., Sudbury, Ontario

The basic principle of this technique is that each individual's bite needs to be determined scientifically in a way which considers that bite unique and not subject to standardization. A theory is advanced upon which the logic of the mechanics of the procedure suggested for establishing centric relation, rests.

IF THE atmosphere of uncertainty that prevails between the prosthodontist's chair and the technician's bench is ever to be cleared, the prosthodontist must employ a technique that is devoid of all uncertainty. Only then will the technician be able to proceed with confidence, knowing that his efforts will not have incorporated in them any element of guess originating at the dental chair.

Role of Centric Relation

The dentist, like the orthopedist, must think in terms of anatomic form and physiologic function. He must approach the task of full denture construction with the idea of restoring the muscles of mastication and the adjacent structures to their normal size and function. Proceeding with this end in view, the prosthodontist must bear in mind that the positional relationship of the mandible to the maxilla is of greatest importance. On this relationship, commonly known as centric relation, the success of his efforts depends. All relations which deviate from centric relation must be considered eccentric.

Centric relation is the greatest help that can be supplied (1) in attaining good esthetics, (2) in assuring functional efficiency, (3) and in affording protection against friction and trauma of the ridges.

Definitions

Centric relation has two components: horizontal dimension and vertical dimension. These dimensions must be determined scientifically. The horizontal dimension is the positional relationship of the mandible to the maxilla in the mandible's most retruded position on a definite level of closure. This level of closure is the inter-ridge space and is known as the vertical dimension. It is correct when the ridges are so related that the mandible is in the exact position to the maxilla that existed when the natural teeth were held in centric relation at the height of the patient's natural development, and before any pathologic changes had occurred due to abrasion, loss of teeth or drifting.

In view of these considerations, it can probably be said that there is only one correct bite for each individual. All the measurements, statistics, and rules which have been assembled with the object of standardizing the length of the bite constitute an erroneous approach to the problem because, in every individual, the muscles of mastication bear a relation to the other parts of the head which is not duplicated in any other person.

Functional Centric Relation

1. Observing a human skull, we note that when the teeth are held in the functional centric position the cusps interdigitate.

2. The mandible is retruded on the horizontal plane to such an extent that the condyles are *upright* in the fossae.

3. A definite vertical space exists between the upper and lower ridges which is determined by the extent of eruption of the posterior teeth.

Between the condyle heads and the wall of the glenoid fossae there is a space. This space is occupied by the articular cartilage and the synovial fluid of the temporomandibular joint.

Theory of Opening and Closing Movements

Every edentulous patient is capable of the fully open and fully closed movements. In the fully open position of the mandible (Fig. 1), the condyles are forward in the fossae. As the mandible travels upward, the condylar path of motion is upward and inward. This direction is determined by the curvature of the anterior wall of the glenoid fossae against which the condyles slide upward and inward; thus the incisor points of the mandible and the condyles are in the circumference and not in the axis of this movement. This sliding rotary articulation prevails until the condyles are upright in the fossae or in the functional centric position.

From this position, there being no teeth present to stop it in its upward trend, the mandible continues to rise. The instant it goes above the centric position, the condyles rotating backward meet resistance against the fossae walls. The natural sliding rotary articulation, with the rotation point on the ramus, ceases and a new center of rotation (Fig. 2) is established at E. The condyles hinge on the fossae walls, causing an unnatural forward thrust of the incisor point which increases as the mandible continues the closing movement.

Figure 3 shows the natural center and the unnatural center of rotation and the path the mandible moves along in the case of each rotation point.

The Theory Demonstrated

The two distinct paths which the mandible travels in its journey from the fully open position to the fully closed position may be charted in the following way:

1. A mandibular positioner is seated on the lower baseplate (Fig. 10).
2. A pencil is attached to the anterior end of a metal bar that fits into this mandibular positioner.
3. The bar with the pencil is attached to the mandibular positioner (Fig. 13).
4. The baseplate is placed in the patient's mouth and held securely with an elastic band under the patient's chin.
5. A record card is held against the patient's right cheek at right angles to the pencil.
6. The patient *retrudes* the mandible and then opens and closes to the extremes (Fig. 14).

The pencil will record arc AB and BC from the two centers of rotation D and E (Fig. 3). Figure 15 is a photograph of the recorded paths.

Laboratory Technique for Mandibular Positioner

1. Procure models.
2. Adapt shellac baseplates to upper and lower models. Do not cover retromolar pads with baseplates on lower model.
3. Grease models with vaseline.
4. Line upper and lower baseplates with zinc oxide eugenol.
5. Remove baseplates from models.
6. Clean off excess vaseline from models and baseplates.
7. Flow carding wax around the periphery of upper and lower baseplates.
8. Place a spot of sticky wax on the anterior ridge of upper baseplate.
9. Attach recording plate to baseplate by means of the sticky wax; make level and flush with ridge.
10. Flow Kerr's snow-white plaster under recording plate to support it.
11. Trim excess plaster; allow to set.
12. Smokestain the recording plate on the upper baseplate. (A small pledget of cotton dipped in oil of cloves and ignited will create a smudge that will quickly smoke the plate.)
13. Place a little more compound on the lower baseplate than is necessary to level off the occlusal surface.
14. Place the mandibular positioner on the occlusal surface.
15. Hold by lightly sealing with a hot spatula.
16. Have the recording pin set at the halfway mark.

Intra-oral Tracing Device with Face-Bow Attachment

The device I use for recording the Gothic arch is homemade; yet the results obtained with it are simple, accurate, and constant. A detailed description is unnecessary at this point, as both the tracing device and the recording disc are shown in Figures 10 and 12 and the procedure for assemblage is given under Laboratory Technique.

Gothic Arch Tracing for Horizontal Dimension

The Gothic arch tracing is a graphic reproduction of the movements of the mandible. It is a reliable means of ascertaining the *horizontal position* of the mandible at any practical level of closure.

1. When the tracing device is placed in the patient's mouth, the patient is instructed to close and bring the stylus against the recording plate lightly. Rocking of the baseplates is avoided because they have been stabilized with lining. The stylus against the recording plate serves as a central bearing device and with this pinpoint contact between the upper and lower baseplates, all horizontal pressure is eliminated in the lateral movements; thus, only a vertical pressure is exerted. Due to the vertical muscular pull, the pressure of the mandible against the lower baseplate is transmitted through the stylus to the upper baseplate which in turn transmits the pressure to the ridges. Therefore, the pressure on all four ridges is equalized and is equal to the pressure in the fossae inasmuch as the mandible is supported against the base of the skull from three points of contact—the right and left condyles and the stylus.
2. Maintaining this contact, the patient moves the mandible forward, backward, and to the right and left. These movements record a Gothic arch. The straight line is caused by the forward and backward movement; the lateral arms are established when the mandible moves from one side to the other. The condyles alternately meet resistance against the fossae walls; one side rotates while the other side moves forward, as right and left movements are made. The straight line bisects the angle formed by the lateral movements, thus centering the relationship of the mandible to the maxilla. The centric position on the Gothic arch is at the apex where all lines meet.

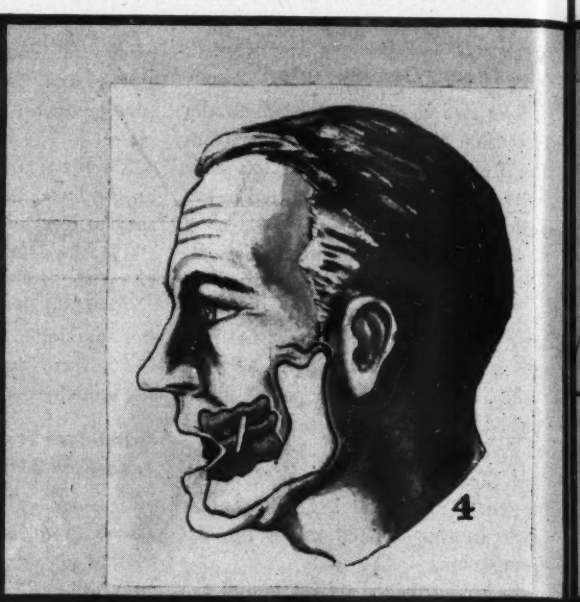
It is agreed that the Gothic arch tracing is an accurate and reliable means of ascertaining the horizontal position of the mandible in its relation to the maxilla. Vertical dimension is the other component of centric relation to be determined.

Technique

To establish centric relation on an *arbitrary* vertical opening, the intra-oral tracing device, having been prepared for the case, is tried in the mouth with the tracing pin set at the halfway mark. If the vertical seems correct, accept it; if it is too high or too low, the tracing pin, which is adjustable, is used as a vertical spacer. Its height can be increased or decreased by simple manipulation until the inter-ridge space is correct.

1. The recording plate is smoked and the patient is instructed to go through the usual jaw movements to describe a Gothic arch. He should at all times keep the pin gliding over the surface of the recording plate with only enough pressure to maintain contact. If it is observed that the apex of the arch is not centered on the upper baseplate, the positioner should be lightly heated and moved so that the pin will not only serve as a tracer but also as a central bearing device.
2. When the operator is satisfied with the tracing and its position, a small hole is made at the apex of the

H
B
A
D
1


4

C
H
B
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5

C
S
D
B
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8

9

Theory of opening and closing movements of the mandible:

Fig. 1—Movement is from open position upward and inward from center D. Arc AB; radius DA. Arc KH; radius DK. Rotary sliding articulation. Condyles in the circumference and not in the axis of the closing movement.

Fig. 2—Movement is from closed position downward and inward from center E. Arc CB; radius EC. Hinge joint. This articulation causes an unnatural forward thrust of the mandible which is magnified as the mandible continues the closing movement.

Fig. 3—Arc AB and Arc CB cross at B. B point where one movement starts and other ends. Arc AB from center D—natural; arc CB from center E—unnatural.

Practical application of the theory with bite rims:

Fig. 4—Open position on bite rims. Condyles forcibly retruded from H to E. Line indicates relation of lower rim to upper rim. Horizontal position of mandible on too high a vertical.

Fig. 5—Closed position; condyles retruded. Lines not continuous. Lower line anterior to upper line. Horizontal position of mandible on too low a vertical.

Fig. 6—Normal closure. Condyles in normal relation to fossae. Lines continuous. Normal vertical established. When the vertical is increased to where the forward movement started, (B in Fig. 3) the vertical and horizontal dimensions are established.

Application of the theory with the mandibular positioner:

Fig. 7—Gothic arch tracing taken on open bite. Hole made at apex of arch on recording disc. Condyles retruded forcibly H to E.

Fig. 8—Tracing taken on closed bite. Condyle retruded. Tracing anterior to hole. Vertical increased until pin engages hole.

Fig. 9—Pin engages hole. Vertical has reached height where Arcs AB and CB of the two movements cross at B (Fig. 3). Normal vertical with condyles normal in fossae—centric relation.

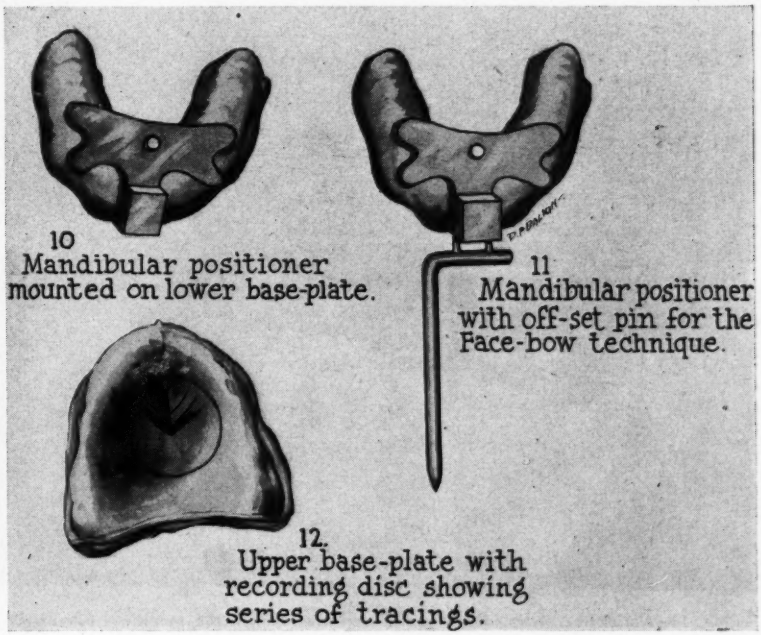
arch with a round bur number 4.

3. The tracing device is returned to the mouth and the patient closes.

4. The recording pin engages the hole. While in this position, the operator places Kerr's snow-white plaster between the upper and lower baseplates on each side. When the plaster has set, the upper and lower baseplates, which are locked together, are removed from the mouth.

5. The upper and lower models are placed in their respective baseplates and sealed with sticky wax before mounting. Figure 18 shows the models mounted in centric relation.

To establish *normal* centric relation, the tracing device is prepared as usual. The horizontal dimension will be determined by means of the Gothic arch tracing which indicates the retrusive position of the mandible. If the muscles that control jaw movement have a normal behavior pattern, they will cause a normal separation to be established between the ridges that are already on the correct horizontal by virtue of the tracing.



10
Mandibular positioner mounted on lower base-plate.

11
Mandibular positioner with off-set pin for the Face-bow technique.

12.
Upper base-plate with recording disc showing series of tracings.

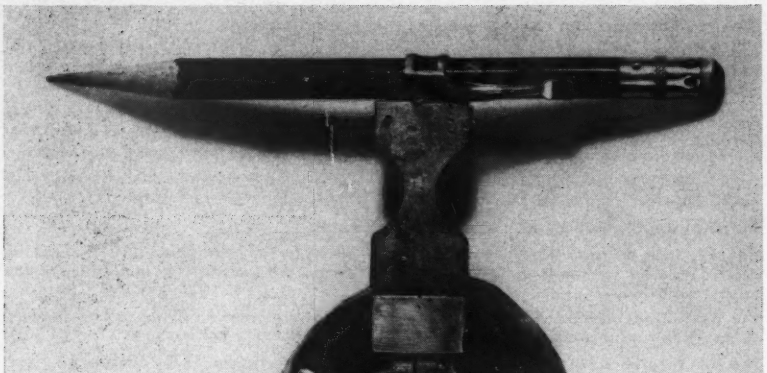


Fig. 13—The bar with the pencil is attached to the mandibular positioner.

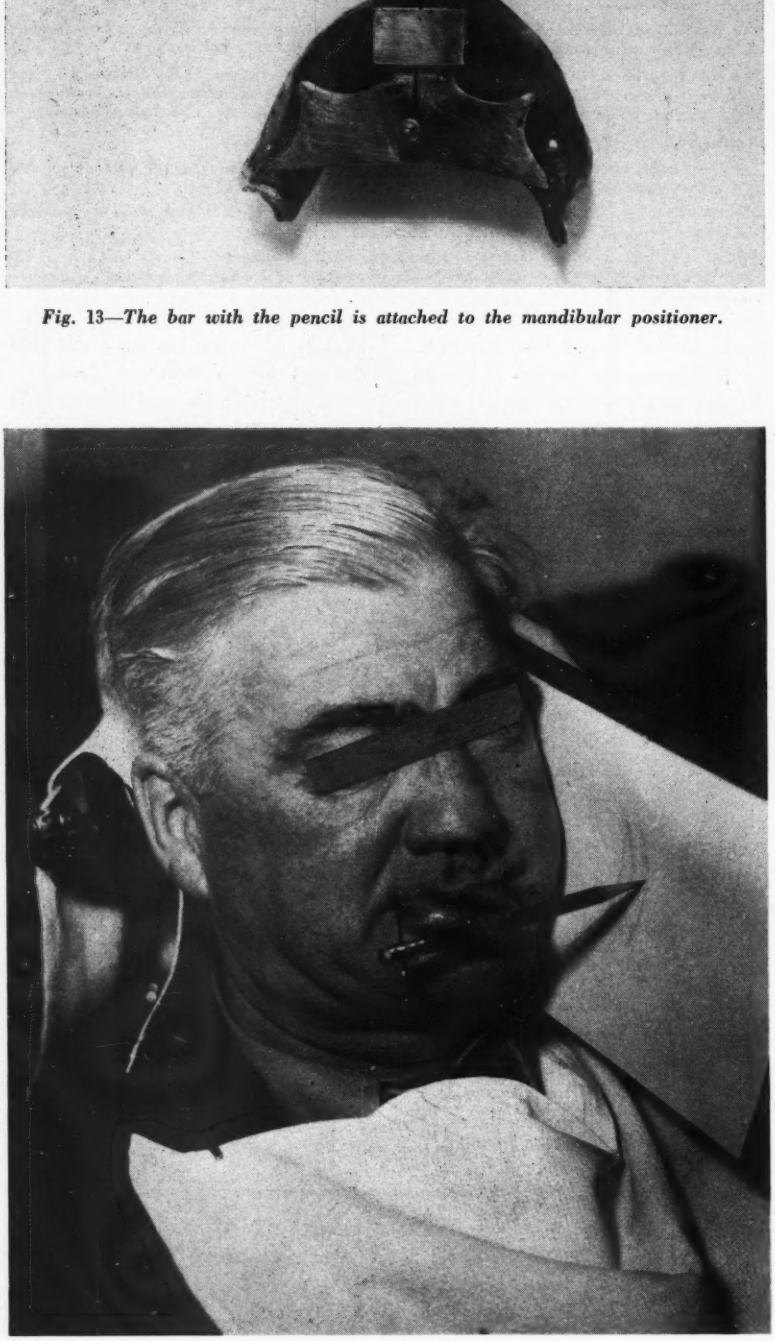


Fig. 14—Patient recording open and closed movements, the mandible retruded.

Procedure—1. Set the recording pin so that the inter-ridge space is 3 or 4 millimeters too great *and no more than* 5 (Fig. 7). (To demonstrate and make the procedure clear, the exact figures have been used that were obtained in establishing centric relation in a clinical case.) Measure the height of the pin; it is 15 millimeters.

2. The patient records a Gothic arch tracing, hole made at apex. Normally at this level of closure, the condyles are forward in the fossae. To make a tracing, the mandible is *forced* into retrusion, carrying the condyles back in the fossae where they alternately establish lateral centers of rotation in making the tracing. The horizontal is now on an exaggerated vertical, somewhere along path AB in Figure 1. The exact position does not matter as the mandible has been *forced into retrusion* to a point where the condyles contact the same articulating surface of the posterior wall of the fossae that they would contact if the tracing were taken at the normal vertical or on any point on path AB. But the vertical must not be too exaggerated as the mandible is forced into retrusion. This is a strain and there is danger of the mandible being in a state of slight lateral thrust due to the abnormal performance of the muscles involved. This lateral thrust is only detected when the teeth are set up and tried in the mouth.

3. Lower the recording pin so much that the vertical is too low (Fig. 8). Measure the height of the pin; it is 8 millimeters.

4. Smoke the recording plate and trace another Gothic arch. This time the tracing is anterior to the hole which was made at the apex of the tracing on the exaggerated vertical. This second tracing is the horizontal on too low a vertical, somewhere on path CB in Figure 2. The condyles have gone into retrusion without being forced. Somewhere between the hole on the recording plate and the tracing anterior to it is the correct vertical. These tracings have been taken on two paths of motion, AB and CB in Figure 3.

5. A series of tracings is taken, the

height of the pin being increased for each tracing. The inter-ridge space is thus increased, the recording pin comes closer to the hole on the recording plate, and the mandible travels downward on the path of motion CB in Figure 2. This continues until the mandible in its downward trend reaches a point where the pin engages the hole on the recording plate. (Fig. 9).

The mandible comes to the end of path CB and is just about to enter a new path of motion AB (Fig. 3) when the recording pin engages the hole in the recording plate. We know that the hole is the horizontal position we established on the path AB when we forced the condyles into retrusion to form the Gothic arch; so the vertical reaches the height where path CB ends and AB starts, establishing centric at B (Fig. 3).

Mechanics Explained—Measure the height of the pin; it is 12 millimeters. This height is necessary to open the bite sufficiently to bring the mandible to the end of CB where the condyles break contact at E. At this instant, a new center is established at D, the pin engages the hole on AB, and the condyles are upright in the fossae.

The reason the pin first engages the hole at 12 millimeters instead of 15 millimeters is this: When the pin was set at 15 millimeters, the mandible was placed some distance below the normal vertical on AB; to scribe a Gothic arch at this level, the condyles were forced into retrusion, thus establishing the horizontal for any point from 15 millimeters up to B (Fig. 16). Since the mandible was coming down path CB, it came to the end of this path when the pin first engaged the hole which was on the start of path AB. In this case, the height of the pin was 12 millimeters; but the pin continued to engage the hole until its height was 15 millimeters, the height at which the original tracing was taken on a point 3 millimeters below the normal on AB.

Face-bow Technique

1. Locate the condyles. In reality, the purpose is to locate the maxillary axis. Place the index finger on the patient's face just in front of the tragus

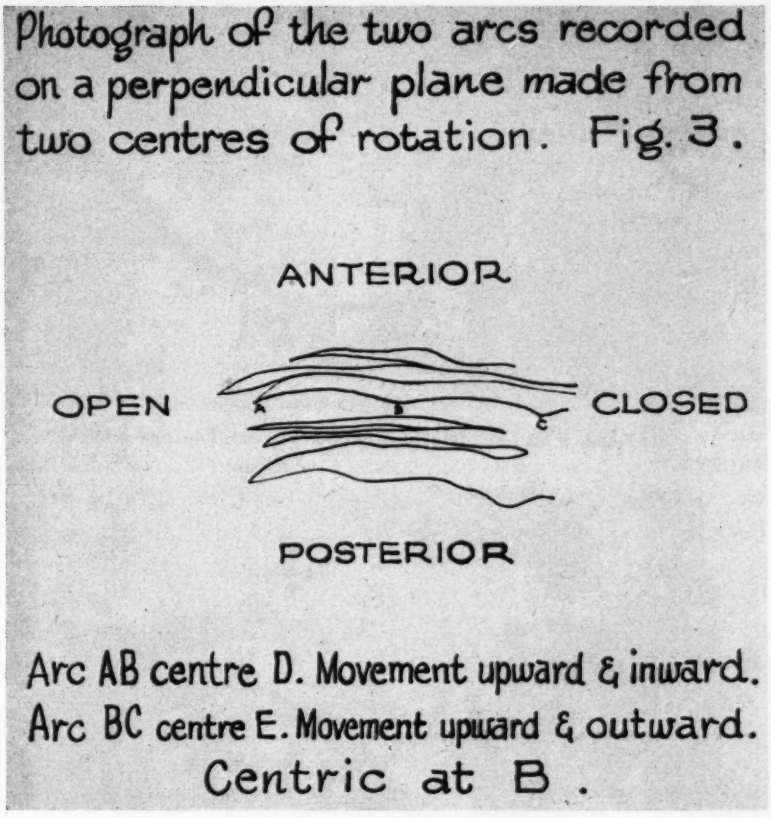

Photograph of the two arcs recorded on a perpendicular plane made from two centres of rotation. Fig. 3.
ANTERIOR
OPEN
CLOSED
POSTERIOR
Arc AB centre D. Movement upward & inward.
Arc BC centre E. Movement upward & outward.
Centric at B.

Fig. 15

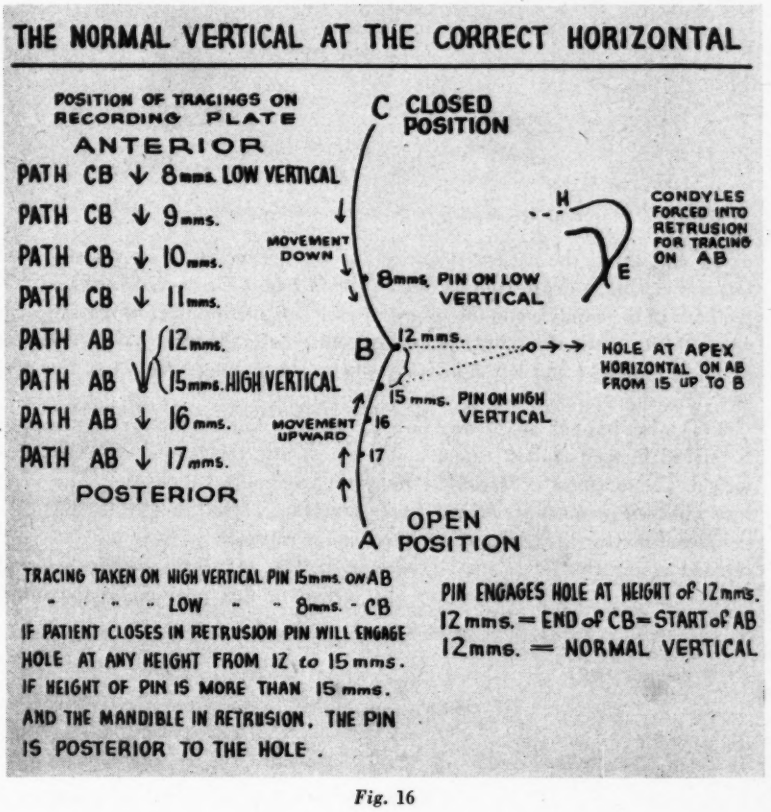

THE NORMAL VERTICAL AT THE CORRECT HORIZONTAL
POSITION OF TRACINGS ON RECORDING PLATE
ANTERIOR
PATH CB ↓ 8mms. LOW VERTICAL
PATH CB ↓ 9mms.
PATH CB ↓ 10mms.
PATH CB ↓ 11mms.
PATH AB 12mms.
PATH AB 15mms. HIGH VERTICAL
PATH AB ↓ 16mms.
PATH AB ↓ 17mms.
POSTERIOR
C CLOSED POSITION
MOVEMENT DOWN
8mms. PIN ON LOW VERTICAL
H
E
CONDYLES FORCED INTO RETRUSION FOR TRACING ON AB
B
12 mms.
HOLE AT APEX HORIZONTAL ON AB FROM 15 UP TO B
15 mms. PIN ON HIGH VERTICAL
MOVEMENT UPWARD
16
17
A OPEN POSITION
TRACING TAKEN ON HIGH VERTICAL PIN 15mms. ON AB
" " " LOW " " 8mms. " CB
IF PATIENT CLOSES IN RETRUSION PIN WILL ENGAGE HOLE AT ANY HEIGHT FROM 12 to 15 mms.
IF HEIGHT OF PIN IS MORE THAN 15 mms. AND THE MANDIBLE IN RETRUSION, THE PIN IS POSTERIOR TO THE HOLE.
PIN ENGAGES HOLE AT HEIGHT of 12 mms.
12 mms. = END of CB = START of AB
12 mms. = NORMAL VERTICAL

Fig. 16

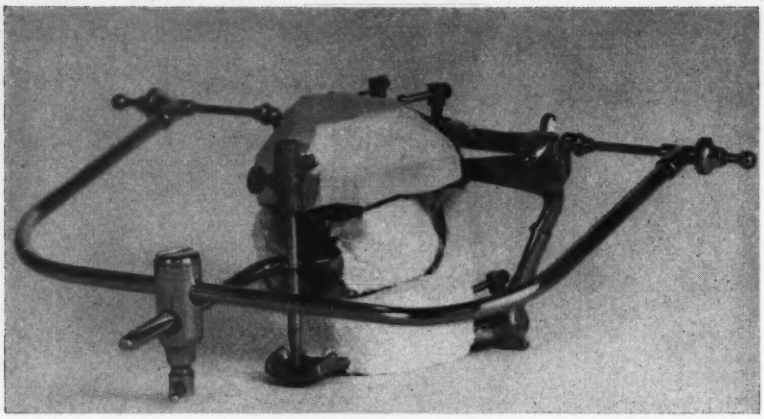


Fig. 17—Case mounted on Gysi simplex articulator in centric relation with the snow face-bow.

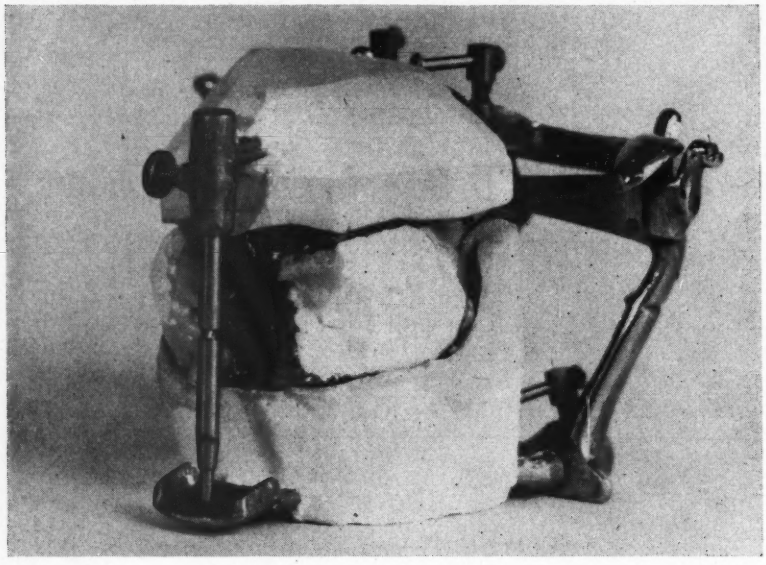


Fig. 18—Models mounted in centric relation.

of the ear. While the patient is opening and closing, a depression between the head of the condyle and the tragus can be felt. Mark the point decided upon, at the right and left side, with an eyebrow pencil.

2. The left pointer of the face-bow is pushed in to its fullest extent and locked. The face-bow is carried to the face and both pointers are placed over the pencil marks. The right pointer is pressed against the tissues and locked. The reading on the right pointer is taken. The pointers are released and the face-bow is removed from the face.

3. The total number of markings on both pointers is taken and divided by two. The pointers are set to the new reading.

4. The bite-blocks are returned to the mouth, the patient closes in centric, and holds that position. The offset pin (Fig. 11) is fitted to the mandibular positioner.

5. The face-bow is adjusted and locked in this position to the offset pin. The pin causes no discomfort to the patient. The depression of the lower lip caused by the offset pin is slight as the height of the mandibular positioner, into which fits the offset pin, is about at the level of the lower lip and the jaws are securely held in centric relation.

6. The pointers are released and the face-bow with offset pin is removed from the mandibular position. The bite-blocks are plaster checked in centric relation and removed from the mouth.

7. Registrations are now complete for mounting. When mounting the case, the pointers may have to be slightly changed from the recorded registration to fit the articulator. This will not change the accuracy of the case if an equal alteration is made on both pointers. Figure 17 shows the case mounted on the Gysi simplex articulator in centric relation with the snow face-bow.

Summary

1. The mandible travels two distinct paths of motion from the fully open to the fully closed position.

2. These paths of motion emanate from two distinct axes of rotation.

3. The Gothic arch tracing records the horizontal dimension.

4. The mandible is retruded in scribing a Gothic arch.

5. The position of the condyles in the fossae depends upon the vertical dimension.

6. It is possible to determine the horizontal and vertical dimensions.

7. Conjecture can be eliminated in establishing centric relation.

Stevens Building.

Editor's Note: Doctor Legge will be pleased to furnish full details concerning the construction of these instruments to any member of the profession who requests this information from him.

The Editor's Page

IT HAS BEEN thirty-five years since Frank Billings formulated the theory of focal infection. In the intervening years some dentists and physicians, through their excesses in surgery and in clinical enthusiam and through their extravagant promises of cures to patients, have brought the theory into some disrepute.

In his presidential address before the Institute of Medicine of Chicago, Ernest E. Irons, himself a pioneer investigator with Billings, made his present-day evaluation of the theory of focal infection. He concluded that the concept of a focal disease must be considered as a fundamental tenet in modern clinical practice; that, indeed, hidden, symptom-free foci, notably those associated with dental tissues, are important sources of blood-born diseases. Billings's theory has stood the test of time despite the almost fanatical years of wholesale removal of teeth and tonsils.

According to Irons, when Billings formulated his theory, he did not project the theory as a panacea for all the ills of man or as a specific form of treatment for any particular disease. Billings implored clinicians to consider focal infections as a source of general disease and a source to be recognized and sought for more frequently. This is still good advice. There are many factors in disease, both in its causation and its expression. Some people can tolerate massive foci of infection without signs of metastatic involvement. In others, relatively minute localized lesions may produce serious generalized disease.

The degree of resistance varies with nutrition, cellular response, exposure, and the stresses of the environment *plus* the genetic or familial disposition to disease. Our knowledge of the mechanism of resistance is still incomplete. We are constantly perplexed with the violent expression of disease in people who appear robust and in the resistance to disease in people who appear to be weak. Because of the limitations of our knowledge, we should consider every person with areas of dental infection as harboring foci from which may be disseminated into the circulatory tree the bacterial seeds and their destructive products that can produce disease in distant parts. As Irons emphasized even a root-end infection that appears to be encapsulated cannot be considered to be innocent because there are blood and lymph connections to every part of the body.

No one who makes an attempt to evaluate the concept of focal infection can ignore the book by Martin H. Fischer, DEATH AND DENTISTRY.[1] Although this provocative book was published in 1940, it has been largely ignored by the medical and dental journals. Fischer does not write in mild and mellow prose on the subject of infection. He is vigorous and direct when he writes: ". . . the streptococcus [is] the organism most commonly responsible for the largest number of chronic invalidisms. . . . and the most important foci [are] the tonsils and the teeth. . . . What Billings meant was that focal infection was *possible* from anywhere but that its most *probable* site was in the mouth . . . at least ninety-nine per cent of the constitutionally afflicted derive their seeds out of tonsil or tooth and only one per cent or less from all the other sources combined."[2]

Fischer's book is entitled to a lengthier and more comprehensive interpretation but some of the spirit can be conveyed with this kind of positive quotation: "If, because of Billings's teachings, he [the dentist] has not found it well to give his work new direction in the past thirty years, he may employ the next thirty to this end. . . . For the rest, 'dental prophylaxis' will prove more serious and lengthier enterprise. He will, of course, place fewer crowns at five dollars and build fewer fixed bridges at five hundred. But other services will pay him quite as well. Tooth pulling is no longer boy scout first aid; operation upon the mandibles is as serious surgery as similar business in a hip joint; the after-care of infected facial bones is not a matter of luck any more, but of skill and days and months; every anesthetic, whether local or general, is freighted with danger. And what grand opportunity in the making of 'replacements' that are surgically clean, really fit, function, maintain contour and look right! Need the general surgeon, the orthopedist, the reconstructionist be envied? A public not only needs these services; it demands them."

---

[1]Fischer, M. H.: Death and Dentistry, Springfield, Illinois, Charles C. Thomas, 1940.
[2]Ibid., pages 43, 48, and 230.

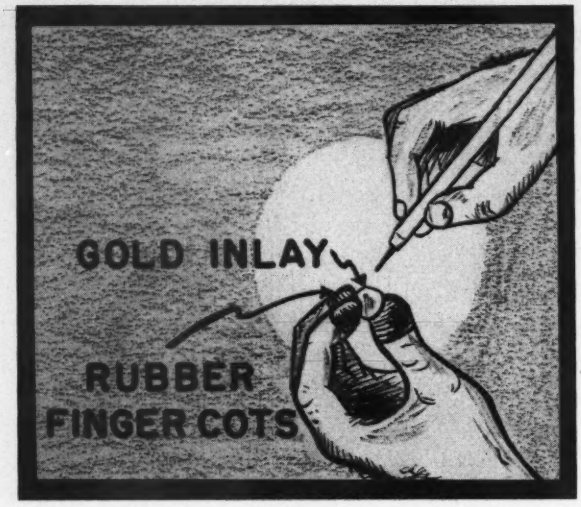


Fig. 1

Protection of Fingers

J. C. Shotton, D.D.S., Cleveland

Fig. 1—During inlay finishing procedures, the thumb and first two fingers are covered with Latex rubber finger cots. These protectors absorb the frictional heat from polishing, facilitate holding the casting, and protect the fingers from injury.

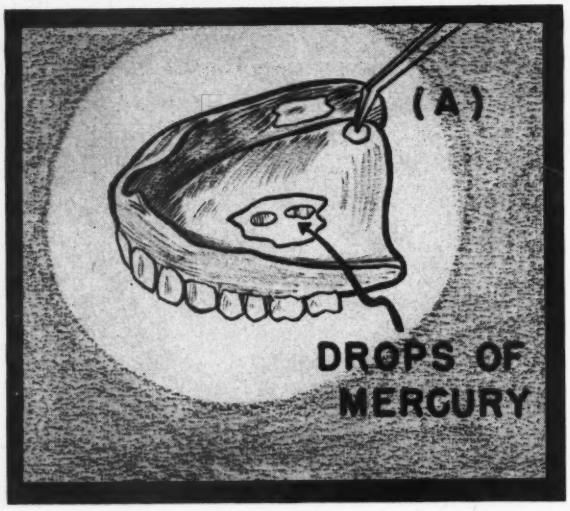


Fig. 2

Removal of Tinfoil from Acrylic

B. F. Outlaw, D.D.S., Dallas

Fig. 2—After processing, the tinfoil that adheres to the tissue surface of an acrylic denture may be removed by using mercury. A pellet of cotton (A) is held in a pair of steel pliers. Several drops of mercury are placed in the tinfoil area. The area is rubbed briskly with the cotton pellet. After the tinfoil has been removed, the denture is cleaned with alcohol and scrubbed with soap and water.

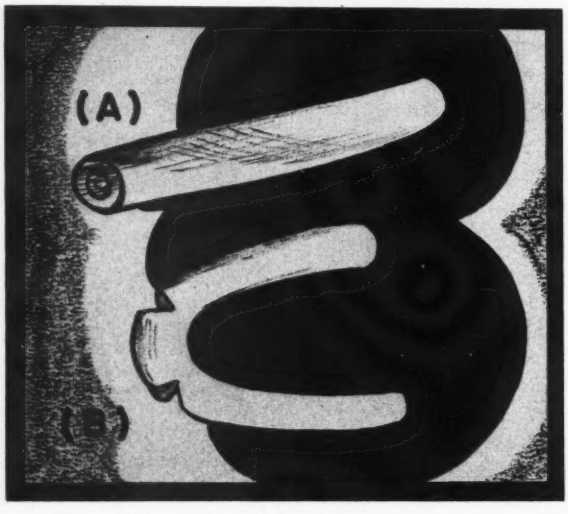


Fig. 3

A Modified Cotton Roll

Bernard S. Rosen, D.D.S., Oakland, California

Fig. 3—A long cotton roll (A) is grooved in two places (B) and bent to conform to the upper and lower arch. This double cotton roll is indicated when operating on the upper molars. The advantages are: The supported upper roll is kept in the proper position; the absorbent power is greater than when a single roll is used.

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...GGESTIONS . . . .

Increased Retention for Gingival Inlays

Paul D. Hogg, D.D.S., Birmingham, Michigan

Fig. 4—With a bur or stone, place a well-defined groove around the gold or porcelain gingival inlay. Place a corresponding groove around the wall of the cavity. When the inlay is cemented, a cement lock is created which enhances the retention of the restoration.

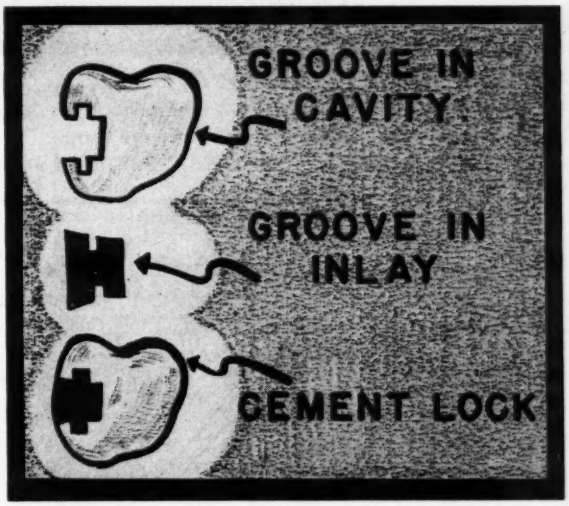


Fig. 4

A Dental Office Deodorizer

Bernard Lilien, D.D.S., Newark

Fig. 5—The dental office is subject to objectionable odors, particularly in the winter. A simple and effective method of deodorizing is to sprinkle a few drops of perfume or toilet water on a hot sterilizer (A) or on a hot pipe or radiator (B).

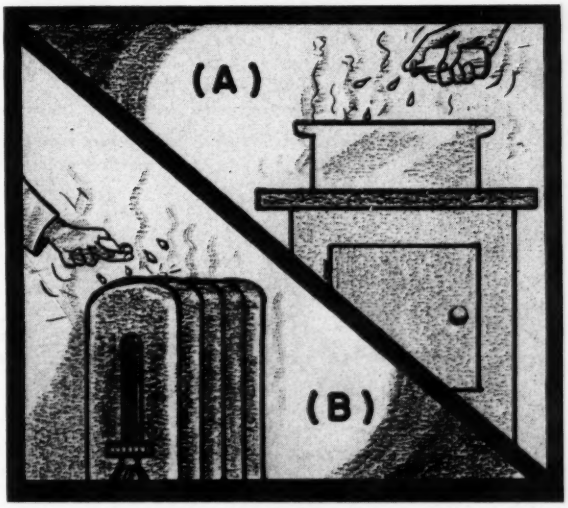


Fig. 5

Dark Room Helps

E. A. Saeger, D.D.S., Pittsburgh

Fig. 6—To conserve space and to prevent the x-ray timer from being knocked off the bench, it is fastened underneath a shelf over the developing tank. A small blackboard on the wall of the darkroom is used for such memoranda as: what films are to be developed and the date on which processing solutions have been changed.

(*Continued on following page*)

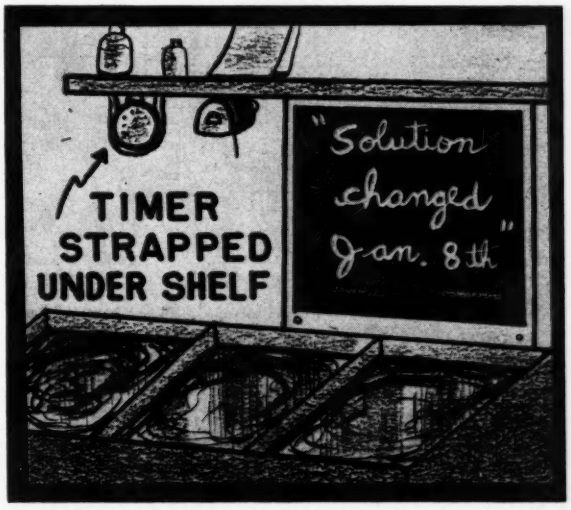


Fig. 6

technique involved; and jot down the advantages of the technique. This shouldn't take ten minutes of your time.

Turn to page 44 for a convenient form to use.

Send your ideas to: Clinical and Laboratory Suggestions Editor, THE DENTAL DIGEST, 708 Church Street, Evanston, Illinois.

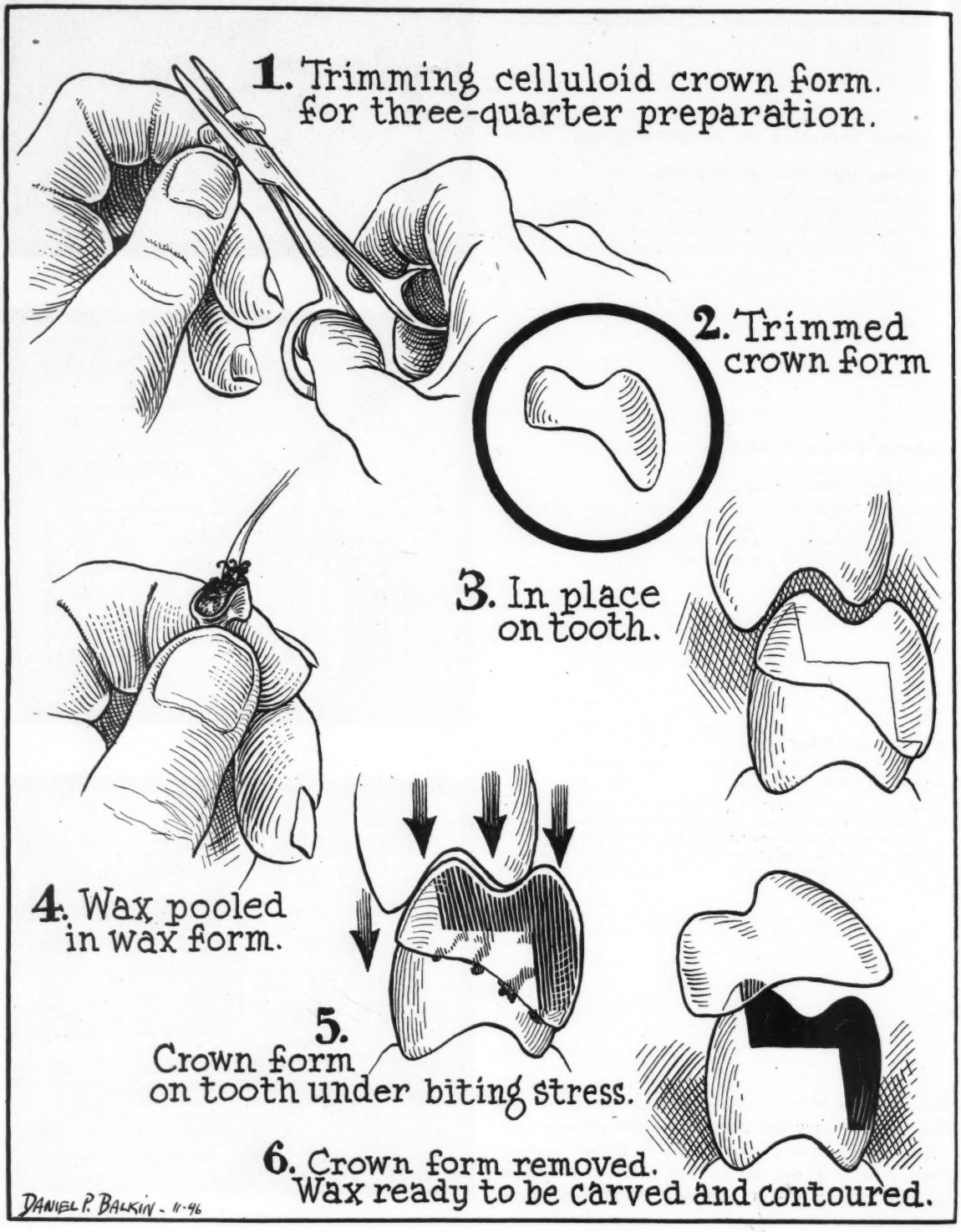
Closed Mouth Direct Wax-up Technique for Class II Inlays and Three-Quarter Cast Crowns

Charles H. Davidson, B.A., D.D.S., Bronx, New York

Technique

For the direct wax-up of class II gold inlays and three-quarter cast gold crowns, use a celluloid anatomic crown form.

1. Select a proper crown form, one that will fit the tooth snugly. Contour the form with small curved scissors (Fig. 1), leaving aprons at the proxi-


1. Trimming celluloid crown form. for three-quarter preparation.
2. Trimmed crown form
3. In place on tooth.
4. Wax pooled in wax form.
5. Crown form on tooth under biting stress.
6. Crown form removed. Wax ready to be carved and contoured.
DANIEL P. BALKIN - 11-46

mals and covering the entire proximal preparation. Trim away the rest of the crown form, leaving the entire occlusal intact (Fig. 2). A tight fit and proper contouring are essential.

2. Place the trimmed crown form on the tooth (Fig. 3) and have the patient bite down firmly, thus pressing the occlusal part of the crown form or matrix into shape.

3. Lubricate the inside of the crown form with glycerine and the tooth with saliva.

4. Fill the matrix with softened blue inlay wax, and pool the entire mass with the cleoid end of a Vehee carver (Fig. 4). Fill the entire inside of the crown form.

5. Place the form in position on the tooth and force to position as far as possible. Then have the patient bite on the crown form as hard as possible in centric (Fig. 5), thus forcing the crown form to position. Allow it to cool under biting pressure; then chill it in the mouth.

6. When the wax is sufficiently chilled, break off the excess which has flowed out from under the crown form. It will be found that the wax breaks cleanly at the edge of the crown form if it has been chilled properly.

7. It may be possible to remove the lubricated crown form from the tooth without lifting the pattern along with it (Fig. 6); on the other hand, the wax-up may come along with the crown. In either case, the crown form will slide easily from the wax-up.

8. If the pattern is incomplete at any point, simply replace the pattern in the crown form, add a slight amount of wax at the place to be built up, and reseat the crown form under biting pressure.

9. When the impression is completed, proceed to contour and sprue it in the usual manner.

Conclusions

An accurate, scientific, and controlled closed mouth technique has been presented here which embodies all the advantages of the direct method.

1. Better condensation is obtained with this technique than with a seamless copper band or a copper strip because the wax is forced downward at all times (due to the intact occlusal portion of the matrix) and flows in a gingival direction, while the excess flows out from under the crown form.

a) In using a copper band, the wax flows in two directions, occlusally *and* gingivally.

b) A copper strip tends to widen out when wax is forced to position with the finger.

2. Condensation is excellent with this technique because wax is forced into all line and point angles. Rounded impressions are thus eliminated and the necessity of repeatedly trying to obtain a well-condensed and sharp pattern is avoided.

3. Any diminution in the working qualities of the blue wax by pooling has not been found with this technique.

160 *East 188th Street.*

Teething and Its Significance

HENRY J. KRUSKA, D.D.S., Bristol, Indiana

THE DIAGNOSIS of pathologic dentition becomes less frequent as the science of medicine progresses and the diagnostic ability of the medical profession improves. Today the amount of space devoted to the pathologic symptoms of teething in medical and dental books and journals is small. Scientific facts seem to verify the stand of those who think that teething produces only a few minor symptoms.

Conditions Coincident With Teething

Anything that affects the infant's health during the teething period may be attributable to difficult dentition. On the other hand, teething and the illness may be merely coincidental. Today the correct etiology of most of the symptoms formerly attributed to teething is known.

1. Intestinal upsets and diarrhea: These symptoms are less common in infants than in years past mainly because of better sanitary conditions. Bottles and nipples are sterilized; pathogenic bacteria in milk are eliminated through pasteurization and the bacterial content of milk is maintained at a low level by refrigeration; diets scientifically balanced and well prepared are used. When diarrhea and intestinal upsets do occur, they are not due to teething. Some bacterial infection or some food that the infant should not have eaten is responsible for the symptoms.

Most children are weaned between four months and one year of age. It is during this period that 55-60 per cent of the symptoms attributed to teething occur. The diarrhea and intestinal upsets probably are due primarily to the change in diet and not to teething.

2. Drooling and increased salivation: These conditions generally begin before teething and are not due to teething but rather to the beginning function of the salivary glands at this age and the failure of the infant to learn how to handle his saliva.

3. Skin disorders: The skin of the infant is extremely delicate and sensitive. A small insect bite can cause an unusually large area of erythema. Saliva drooling from the mouth can cause considerable irritation. Intestinal conditions and diet, too, are very frequently causes of skin disorders; but not teething.

4. Sucking and chewing on the fingers: These are not symptoms of teething but rather a gratification of one of the infant's first impulses and one of his most pleasurable instincts —feeding.

5. Ulcerative stomatitis: This condition is rare in infants. It occurs because of contaminated feeding bottles and poor oral hygiene and there is no direct connection with teething.

6. Fever: The child is in a developmental stage and a rather unstable physiologic equilibrium. He can eas-

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How to Avoid Saving Money

by DANNY KAYE

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ily be upset by very minor disturbances. Generally the eruption of teeth is not sufficient cause for a rise in temperature. The temperature rise is usually due to coincidental illness.

7. Convulsions: These are rarely due to teething. Convulsions occur in children who have abnormal electrical brain waves. It is estimated that ten per cent of people have abnormal brain waves but only about one per cent of them have convulsions while they are adults. During infancy a larger percentage have convulsions because the nervous system is not matured until approximately three years of age. Previous to this age, any slight fever irritates the immature brain and nervous system and convulsions result if the predisposing factor of abnormal brain waves is present.

It has been reported many times that convulsions have been stopped by incising the gums over developing teeth. Actually, if the convulsions stopped after incising, they would have ceased from some very simple treatment such as a warm bath. If nothing else will stop a convulsive attack, opening the gums will not do so. Instances have been reported, on the contrary, in which incising of the gums brought on convulsive attacks.

Infant Care During Teething

Mothers need to be educated in the treatment of infants whom they think are suffering from a teething disorder.

1. They should be warned against the purchase of "teething lotions" or patented medicines which are supposed to make teething easy. These products generally contain potent drugs which, through indiscriminate usage, may prove harmful.

2. The best treatment the mother can render the infant is to keep him in a normal, clean, and healthful environment; properly clothed, and fed with wholesome, uncontaminated food.

3. Mothers who attempt to rub the tooth through the overlying gum should be discouraged from this practice since it is apt to introduce infection into the tooth crypt even if sterile gauze is used around the finger.

4. Incising the gums should be

abandoned. It rarely, if ever, does any good. Parents should not attempt to persuade their physician or dentist to open their child's gums. On the contrary, they ought to be enlightened to the extent that they question any dentist or physician who attempts to use the knife.

5. All that the child usually requires to cut his teeth is something hard to chew. Some food substance which will do no harm if swallowed, such as a piece of hard toast, is ideal.

6. Any symptom occurring during the teething period should be treated as an illness. The condition should not be neglected because it is assumed that the teeth are to blame. Taking care of the infant under the supervision of a physician, treating the symptom, and attempting to locate the source of the trouble make for sound procedure. The teeth should be forgotten.

—From *Journal of Dentistry for Children* 13:110-112 (Fourth Quarter) 1946.

Contra-Angles

"Minor" Oral Surgery . . .

Dentists, in their self-deprecatory expressions, are annoying. Whenever a dentist can use an expression to deflate his dignity, he seems to prefer to do so. He talks about "minor" oral surgery, "temporary" fillings, "permanent" dentures, "simple" extractions, "easy" operations, "freezing" the gums, "a whiff" of gas. This isn't the modest talk of understatement but rather the linguistics of a man who lacks self-respect and self-confidence.

Words reveal our inner selves. If we are unsure, insecure, and uncertain, our words reveal our fears and our deficiencies. In a verbal society, people are guided by words which have no substance in themselves but are rather signal devices that have

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large emotional connotations. The whole science of semantics is built on this concept, that words either incite or soothe, that they are guides to immediate action or sedatives to procrastination.

The dentist who uses the deprecatory expressions "minor," "temporary," "simple," "permanent," "easy," freezing," and so on, lays himself open to trouble because, very often, the "minor" or "easy" or "simple" procedure turns out to be a serious and painful one. We have all seen people whose so-called "simple" extractions have caused violent reactions. Sometimes these have necessitated hospitalization and prolonged postoperative treatment. The patient, who in this case was looking for an "easy" procedure, had every right to think that he was hoodwinked when he had a severe reaction.

It is better to promise little in advance of treatment. It is far better for patients to know the limitations, the hazards, and the possible difficulties attending any procedure. It is far better to have a pleasantly surprised patient in a good postoperative mood than a disappointed patient in a surly mood. Dentists who promise too much are frequently faced with cases in which they cannot fulfill their promises. Far better to promise little and give more than to promise too much and not give enough.

Someday somebody will write a learned article on dental semantics presenting to dentists some of the grisly words that they use everyday in describing services to patients. Along with "simple," "minor," "easy," are such other dillies as "leaking" fillings, "synthetics," "dummies," "skeletons," "saddles." Not one of these words does a thing except depreciate the dental service.

Something Is Wrong With Dental Literature . . .

If anyone has written a first-rate biography of an American dentist, I have never seen the book. A physician-son of G. V. Black wrote a book about his illustrious father. The idea was a worthy one for an admiring son. But the book lacked literary balance and skill. No one has written a biography

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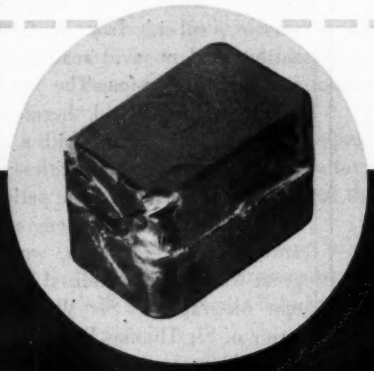

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CLINICAL AND LABORATORY SUGGESTIONS

(*See pages* 32 *and* 33)

Form to be Used by Contributors

To: Clinical and Laboratory Suggestions Editor
THE DENTAL DIGEST
708 Church Street
Evanston, Illinois

From: _____

_____

Subject: _____

Explanation of Procedure:

Sketch:

$10 will be paid to author on publication of accepted suggestions.

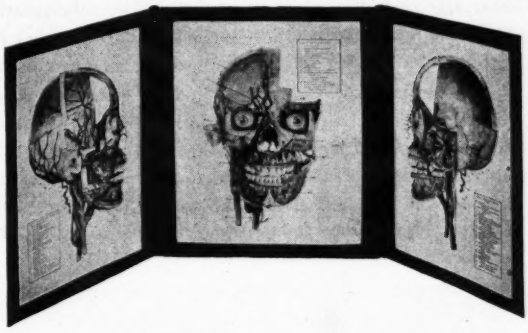
of any other of the other great men in dentistry. Our mighty men die and nobody makes an effort to perpetuate their work. Without a past, the profession has no prospect for a future. Unless we have a method of measurement to chart from whence we came, we have no way to anticipate how far we may go.

There have been some stalwart personalities in American dentistry who, by strong force of character, by unlimited imagination, and vigorous work, advanced the profession against the obstacles of ignorance, inertia, and indifference. Thousands of dentists followed these leaders and without their leadership, the profession never would have advanced. These men are entitled to have our memories of them kept fresh.

Under the present system of values, anyone who attempted a biography of dentistry's great men would be turning his energies to a labor of love. He could expect little or no support in the way of a subsidy from dental organizations and no avid reading support from the profession. The job of biography-writing would, therefore, seem to be one for a person with a substantial personal fortune, limitless time on his hands, and an infinite patience.

In medicine, with a longer history and a deeper tradition, we see the great leaders immortalized by competent biographers. Sir William Osler wrote of Sir Thomas Browne; Harvey Cushing wrote the Pulitzer prize-winning biography of Osler. Recently, Fulton in turn has written the biography of Cushing. This chain of successive biographies is not accidental. Medicine passes down its traditions through the stories of the lives of its great men. Dentistry has a meager tradition and a short history and what we have, we do nothing with. If the cultural level of a profession is judged by its literature, we should hang our heads heavily in shame. Most of our technical books are thick and tedious; most of our articles suffer from a paucity of scholarship and expression; most of our essays are models of banality. These are harsh words and harshly intended. They may even sound like scolding words.

If some dental organization wants



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to do something to advance the profession, it will subsidize a half dozen young men and women in dentistry to spend all their time in helping to develop a dental literature. Such a group could help dentists with their writing chores, dig up the facts on the lives of our great men, interview some of our living leaders, and in general spark a movement among dentists for better expression on the platform and by the written word. This is no suggestion for a Writers' Authority or a Commission on Journalism, or a bureaucracy of any kind. It is not a suggestion for any of this silly kind of totalitarian business. The idea is for a profession that has some affluent societies to think enough of its cultural position to provide scholarships and fellowships to give the opportunity to develop the dental literature.

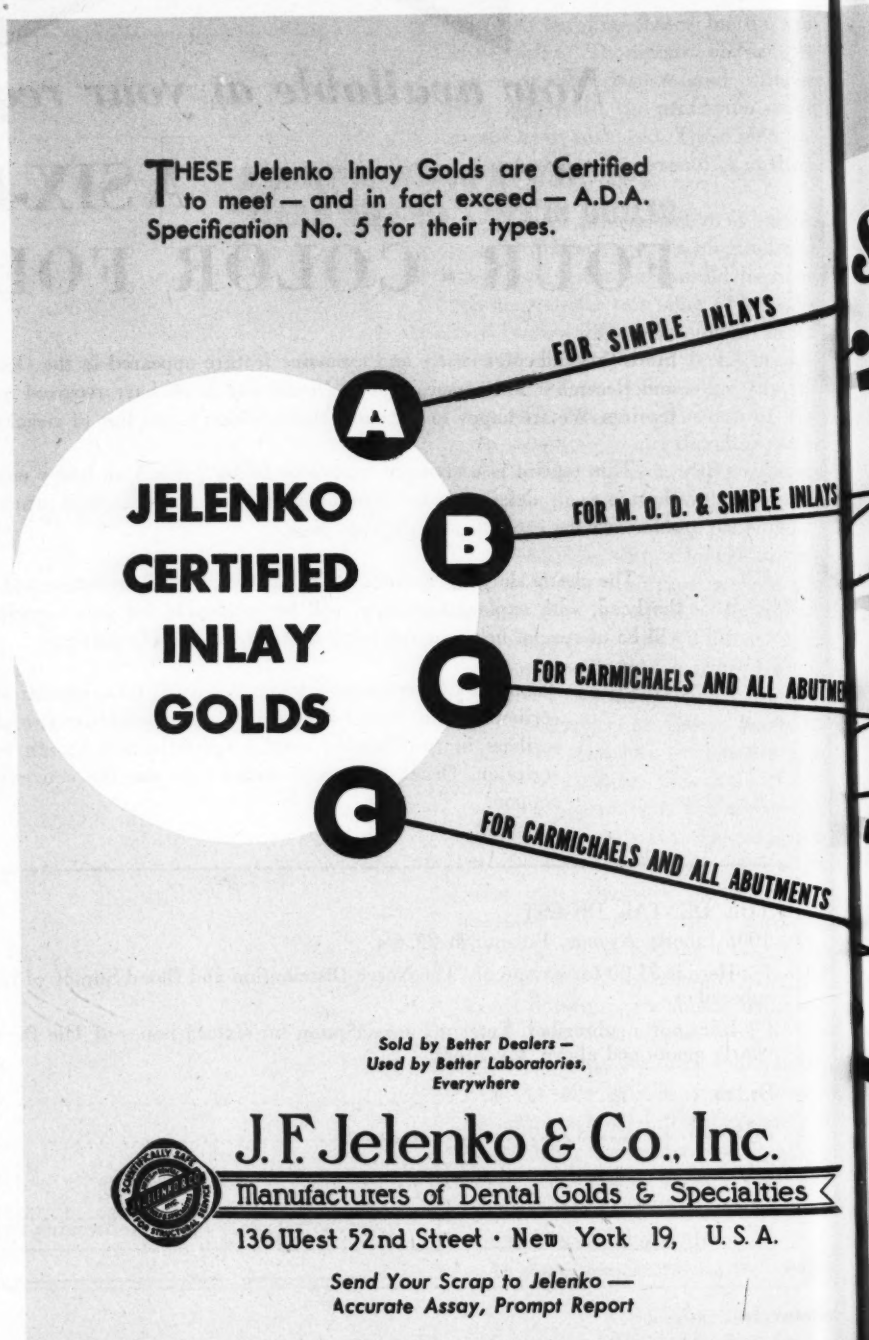
I do not expect any dental society to have the foresight to accept this suggestion because it is a project with a long time rather than an immediate goal. Dentists and their associations are so accustomed to looking at small objects and thinking in small terms that it is hard for them to lift their sights and see big things in future days.

Some of my best friends are dentists!

Who Wants Federal Health Service? . . .

The *Chicago Tribune*, never too accurate with its headlines if its preconceived political philosophy is involved, carried this heading: "British Health Plan Vetoed by Vote of Medics." I would take this to mean that by an overwhelming, resounding negative vote British physicians had told Health Minister Bevan to go to hell fast with his national health service plan. But the story behind the headline is this: Eighty per cent of the 58,000 members of the British Medical Association voted on the issue of "whether they wanted the Negotiations Committee for the Association to enter into discussions with Health Minister Bevan on the terms on which they would serve in the national scheme." When the votes were counted, 23,110 voted against negotiation; 18,972 were in favor of negotiations with the Health Minister. The story proceeds with this interpretation: "The result means in effect that at least 44 per cent of Britain's doctors want the nationalized health service. This would be sufficient for Bevans to start it."

If a similar vote were taken in the United States among dentists and physicians, a percentage in favor of a federalized health service would *probably* not be 44 per cent, but the number in favor would be considerably higher than most of us think. There is a great inarticulate group within the professions whose members do not express themselves either in writing or on the platform. This unorganized group takes little or no part in society affairs or discussions, makes no speeches, and writes no articles. If, however, a specific federalized program were offered them wherein free choice was available and fees were adequate, this group would plump heavily for the project. Isn't it a fact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that almost every dentist and physician has signed up for the Veterans' Administration program? Isn't that a form of federalized health service? I don't want to appear cynical but it seems to me that many of us are practicing double talk—we are *against* socialized medicine and then sign up to practice under the plan of the Veterans' Administration.

I am not taking sides: I'm just asking, "What's what?" In a compulsory national health insurance system, the recipient pays *part* of the costs. In a system such as that of the Veterans' Administration program, the government pays *all*. I would like to have someone strike me out and tell me just exactly what's meant by socialized dentistry. What's the shouting about?

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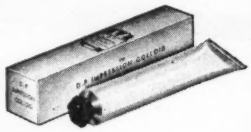

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sonal." All you do with this neat word is raise my blood pressure and build up my sales resistance. When a letter is marked "Personal", it should be just that—something written between two people that is of such an intimate nature that no third party should be the reader. Such letters, when they come into an office, must be respected and put aside unopened. If both the secretary and the recipient have been decoyed by the "Personal" warning when the letter's contents are something as impersonal as a plug for an insurance plan, a denture gadget, or a recent book, I warn you that a sale is lost.

No one feels kindly to subterfuge or to anyone who tries to sneak in his sales talk under cover of false pretense. Copy writers, clever guys that you sometimes are, don't overstep the lines of good taste and write "Personal" on something that isn't! If you do—no sale.—E.J.R.

Temporal Arteritis

D. ALFRED DANTES, M.D.,
New York

TEMPORAL arteritis might be described as an acute or subacute febrile illness, apparently an infection, although of unknown etiology, affecting elderly persons and characterized by a granulomatous type of inflammation of the temporal and other arteries of the head. The original report of a case involving this previously undescribed condition was made more than thirteen years ago. In this time there have appeared in the literature reports of 35 cases, including the original one, which are purported to be examples of this condition. Of these, 27 are unquestionable instances of temporal arteritis although histologic confirmation is lacking in some. The remaining eight cases do not appear to be well enough substantiated clinically or histologically to be considered as more than probable cases of temporal arteritis.

General Clinical Features

Physical Findings—The significant physical findings are almost entirely limited to the head.

(*Continued on page* 50)

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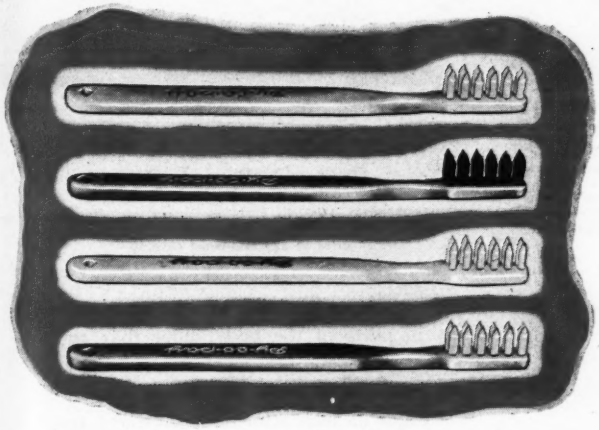
Tuft Spacing	⅛ inch	⅛ inch
Tufts per Row	6	6
Trim	equal length	equal length
Tuft Length	½ inch	7/16 inch
Over all Length	6½ inch	6½ inch
Handle Length	5 inch	5¼ inch
Handle Shape	Straight	Straight



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1. McCauley, H. B., Journal A. D. A., 33:283, March 1946.

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(*Continued from page* 48)

1. Characteristically, a segment of one or both temporal arteries is prominent, indurated, nodular and exquisitely tender.

2. The skin overlying the inflamed artery may be reddened and edematous.

3. The arterial pulsation may be lost if thrombosis occurs. (In some cases similar changes are observed with reference to arteries of the parietal, occipital or postauricular regions.)

4. In most of the cases, a careful search for evidence of arterial disease in parts of the body other than the head has yielded negative results. The evidence in cases presenting possible signs of such arterial involvement appeared to be insufficient to arouse more than a suspicion of arteritis of the radial, brachial, carotid, and dorsalis pedis vessels.

5. The incidence of arterial hypertension in patients with temporal arteritis is certainly not greater than one would expect in a group of elderly persons.

Pain—The outstanding symptom of

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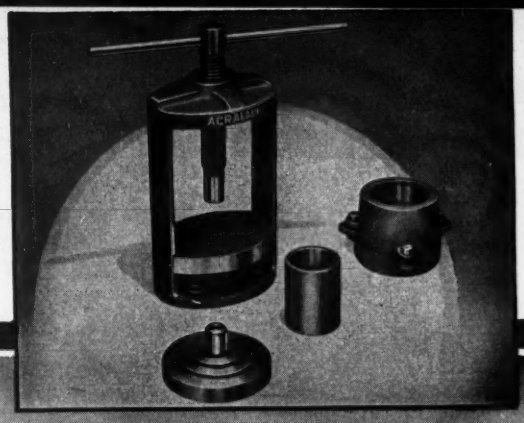

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this condition is pain, which often appears weeks before evidence of any inflammatory process in the involved arteries is discernible. The pain, which may be severe and almost constant, is chiefly temporal in location but, especially when vessels other than the temporal arteries are affected, may involve the occipital and parietal areas. Many patients have considerable pain in the region of the temporomandibular joint which makes mastication difficult. Pains in the extremities have been present in two cases but their significance is not clear.

Fever—Practically all patients have fever from the onset. This elevation of temperature may be very protracted, sometimes persisting for many months. While it is usually of a low grade, it may reach 103° Fahrenheit. There may be, in addition, malaise, weakness and profuse sweats. The appetite is often depressed, and in some cases a state of cachexia has been observed.

Ocular Disturbances—These occur in a considerable number of cases. Some are of a very serious nature. They include: photophobia, diplopia, ptosis and partial or complete loss of vision which may be permanent. In uncomplicated cases, the ocular fundi exhibit only a degree of arteriosclerosis compatible with the age of the patient; but in the cases with disturbed vision, vascular lesions of the retina have been observed. These include: hemorrhages, exudates, edema of the nerve head and thrombosis of the central retinal artery or of its branches.

Etiology—It is not certain that the condition is the result of an infection, although it appears clinically and histologically to resemble an infectious process more than it does a degenerative or "allergic" state.

Treatment—The treatment of temporal arteritis is symptomatic.

1. Resection of a segment of one of the involved arteries has relieved the pain in some cases.

2. The administration of large doses of potassium iodide in conjunction with small doses of arsphenamine has been suggested but the limited experience with this treatment makes it impossible to draw conclusions concerning its value.

3. Periarterial infiltration with local anesthetics and periarterial sympathectomy are other measures which might be tried.

4. Radiotherapy in one case had no apparent effect.

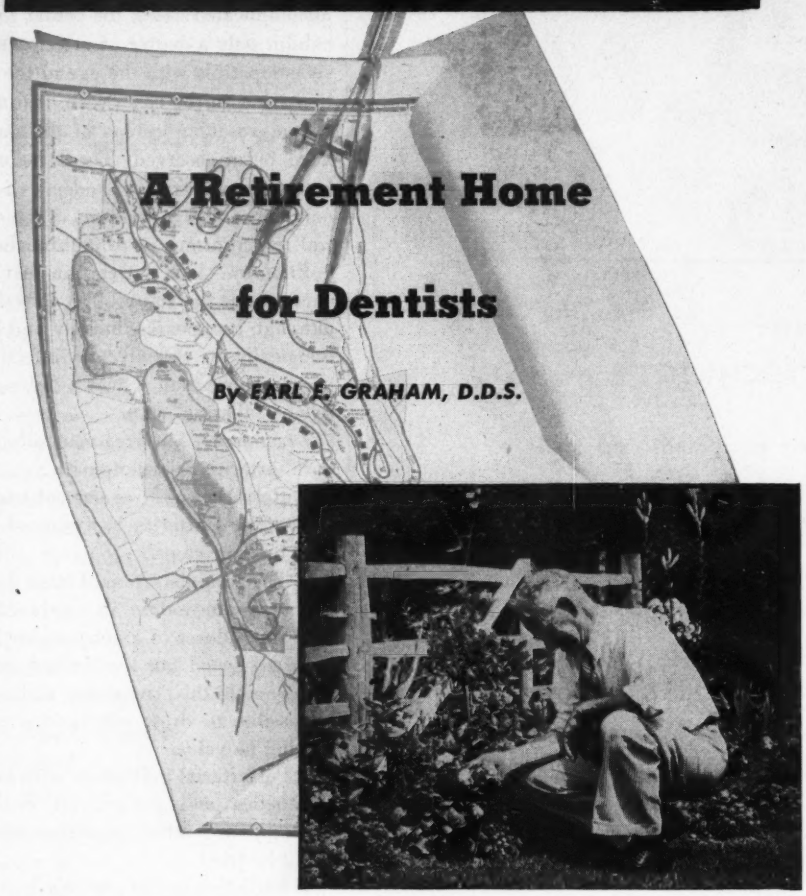
Prognosis—Despite the advanced age at which this illness manifests itself and the protracted course it usually pursues, complete clinical recovery appears to occur in the great majority of cases.

Summary

A comparison of their clinical and pathologic features demonstrates that temporal arteritis is distinct from all the well known forms of inflammatory arterial disorders. Furthermore, the evidence connecting temporal arteritis with some of the very unusual types of arteritis which have been described is so questionable that a decision concerning their relationship should be withheld. It appears highly probable, however, that in some instances temporal arteritis is a manifestation of a widespread arteritis of a special type.

—From *The Journal of the American Medical Association* 131:1265-1269 (August 17) 1946.

In your ORAL HYGIENE this month



A Retirement Home for Dentists

By EARL E. GRAHAM, D.D.S.

"Why should not members of the dental profession who have done so much for humanity provide a retirement home for their own colleagues?" asks Doctor Earl E. Graham, in a continuation of the campaign for dentists' retirement security (started seven years ago in Oral Hygiene). The author asks for comments and opinions of dentist-readers, and will welcome your criticism.

★ ★ ★

"If You Must Cash Those Series 'E' Bonds" . . . read Harold Ashe's article first. It is surprising to note the difference in financial return between right and wrong order of cashing . . . and, surprisingly, the way one would naturally do it is the wrong way. It will pay dollars and cents to read this article.

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Short of dental assistants in your community? The Cleveland Dental Society is carrying out a practical plan for increasing both the quantity and the quality of assistants. Any dental society could initiate a similar plan . . . it is fully explained in George B. Fritz's article, "How Cleveland Trains Its Dental Assistants."

★ ★ ★

Can the government provide successful health care without the personal relationship between the practitioner and patient as it exists in private practice? A physician, Doctor William Hale, answers for the medical profession—in terms which are entirely applicable to the dental profession.

★ ★ ★

"Is Modern Dentistry in Need of a Reform?" . . . "Yes," says Doctor C. L. Meistroff, and we're sure many patients echo his opinion. Dentists who are too self-satisfied now are going to wonder later why their practices have dwindled so alarmingly.

★ ★ ★

"Are You Prepared for Deflation?" by Irving Elbaum, C.P.A., and "Why Don't You Give Interesting Speeches?" by Irving J. Lee, Ph.D. are full of valuable information.

The Effect of Hard Candy and Carbonated Beverages on Tooth Structure

FERNAND E. LA MONTAGNE, Boston

AN INVESTIGATION of the possible relationship between the breakdown of carbohydrate foods in the mouth by oral micro-organisms and the cause of dental caries has yielded the following conclusions:

1. Hard candies cause enamel decalcification which tends to be localized in the cervical regions of the teeth.
2. The decalcification starts as a sensitive cervical erosion.
3. The decalcifying ability of hard candies is due to the bacterial fermentation of the carbohydrate constituents into lactic acid.
4. Constant biting and sucking of hard candies prolongs their action on the teeth, and consequently renders the action more hazardous.
5. The addition of certain acidic flavoring agents to hard candies, such as citric acid, enhances the acidity and increases the harmful effect.
6. Carbonated beverages cause definite damage to the tooth enamel of rats and dogs. A similar action is said to take place on the teeth of humans when soft drinks are consumed in large quantities.
7. The deleterious effect of carbonated beverages is due to the high acidity, with an approximate pH value of 2.6.

—From *Tufts Dental Outlook* 20:4-6 (October) 1946.

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